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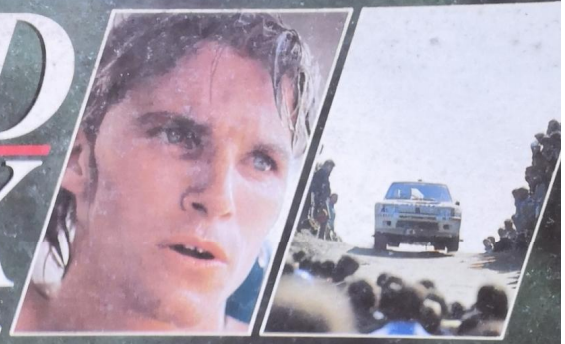
# GRAND PRIX INTERNATIONAL





## TRACK TEST
Renault RE 50

## FORMULA 1
Final phase

## RALLYING
Swedish and Portuguese

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Our new GLi and GLSi models have the fuel-injection badge where other drivers will have the best chance of seeing it.

On the boot.

But the most noticeable feature of these two new Cavaliers is to be found lurking under the bonnet.

We've installed our 1800 engine with the Bosch LE Jetronic fuel-injection system.

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# TOPICS

**H**ans Heyer is busy preparing Tom Walkinshaw Racing's Group C Jaguar. TWR is rebuilding an ex-Tullius Jag and a new 100% TWR Jaguar should be ready for the Le Mans 24 Hours.

**A**yrton Senna the new Team Lotus driver stopped the clocks at an amazing 1m 27.90s at the second Rio testing session. The Brazilian put in his time on qualifying tyres during the third day at Jacarepagua.

**A**l Holbert the Porsche Motorsport director for North America recently announced the creation of a Porsche Cup championship with prize money totalling $85,500. Holbert is also hoping to enter a Porsche at the 1987 edition of Indianapolis.

**T**eo Fabi from Italy is after a drive in the Indianapolis series having lost his place on the Brabham F1 team last year. Rumour has suggested he could very well be at the wheel of a Lotus this season. Corrado his younger brother has given up motor racing to devote himself to the family business (talc mines and various companies in Brazil).

**N**eil Bonnett (Chevrolet Montercarlo SS) won the the Carolina 500 counting for the Nascar series which was held on March 3rd.

**B**arrie Hinchcliffe Productions have made an exciting film lasting 32 minutes for Austin Rover on the 1984 European Tourist Championship.

**T**wo celebrities were present at the Miami 3 Hours, the second round of the IMSA championship — Stirling Moss, commentating for SIN television, and Sammy Davis Junior, the clerk of the course.

## SAAB'S F3 ENGINE

Five years after its official rally department was closed, the Swedish manufacturer Saab has decided to return to motorsport, this time in racing. Announcing the decision to a large party of invited guests in London at the end of February, executive vice-president Sten Wennlo unveiled a Formula 3 version of the Saab 16-valve four-cylinder engine which will be raced in the British, French and Scandinavian Formula 3 championships this summer.

The two-litre racing engine has been developed in England by Nicholson/McLaren. Although an important instruction was that as many standard Saab parts as possible should be incorporated, early tests have indicated that the Saab racing engine can already match the better-known Formula 3 units for power and torque. It will be offered for sale by a new marketing company, Scan+Sport, at a price of £8,000. This is roughly the same as the cost of the established Toyota, VW and Alfa Romeo engines, but it includes the sophisticated electronic SDI ignition system which is fitted to many current Saab cars.

Using the engine in British events will be the Midlands-based team Madgwick, which is 'graduating' from Formula Ford after two club championship winning years. Madgwick owner Robert Synge has ordered three flat bottom chassis from Adrian Reynard, the first Formula 3 designer to gamble on an all carbon-fibre monocoque tub. The team's two drivers are Maurizio Sandro Sala, from Brazil, the reigning British FF2000 champion, and Antony Reid, from Scotland, also with several good FF2000 results behind him.

Mr Wennlo emphasised that this return to competition does not signal the beginning of any move into F1 or even Group B rallying by his company. "*At Saab we've always claimed that a car manufacturer could only justify entering competitions if the experience acquired could also be applied to the future development of standard cars,*" he said. **MD**

## ANOTHER JAPANESE GP

Japan has made its application to stage a F1 GP on April 6th, 1986 on the circuit of Suzuka. If the International Federation gives it the green light it will be the third Japanese World Championship F1 round since 1977 when James Hunt powered his way to victory and clinched the world title.

## LIGIER JS 25 — NOT FAR OFF THE MARK

Team Ligier failed to complete its 100% new development programme by 48 hours, which nevertheless means that the JS 25 will be ready to take part in the opening round to the 1985 F1 season on April 7th at Rio. The single seaters which will be raced by de Cesaris and Laffite have been constructed using new carbon monocoques. For the Brazilian GP, however, the Vichy-based team will only have two JS 25s and one JS 25 B/84 on hand which will be replaced by a third JS 25 as from the Portuguese round, a fortnight later.

Thus, the JS 25 features a revised version of the JS 23's carbon fibre chassis to which a new nose cone has been added, together with an engine cover and side pod covers. The main change concerns the rear suspension which is made up of a lower wishbone and upper rockers and the front unit which comprises double wishbones with push rod and rocker operated spring/damper combination.

The mechanicals vary slightly compared to last year's — following the trend in F1 adopted by Ferrari, Lotus, Renault, etc, the water and oil radiators have been mounted in a fan-shape facing the road. The intercoolers have been placed in an upright position, just behind. The turbo air inlets are above the side pods and the exhaust gas outlet at the end of the side pod.

### TECHNICAL CHARACTERISTICS

**Engine:** Turbocharged Renault engine
**Chassis:** Carbon, kevlar monocoque. Crash-tested at the Cranfield Institute.
**Transmission:** 5-speed Ligier/Hewland gearbox + reverse.
**Steering:** Ligier rack and pinion.
**Suspension:** Front — Double wishbones with push rods. Rear —Lower wishbone and upper push rod.
**Wheels:** Front — 11.5/12 x 13. Rear — 16.5 x 13.
**Dimensions: Wheelbase:** 2,835 mm, **Front Track:** 1,790 mm, **Rear Track:** 1,669 mm, **Height:** 1,000 mm, **Weight:** 540 kilos.

## 1985 GP CALENDAR

After much controversy and legal wrangling the Monaco GP will finally be taking place this year on May 19th, and will be included in the 1985 F1 world championship comprising 17 races:

| | |
|---|---|
| April 7th: | Brazil (Rio) |
| April 27th: | Portugal (Estoril) |
| May 5th: | San Marino (Imola) |
| May 19th: | Monaco |
| June 2nd: | Belgium (Spa) |
| June 16th: | Canada (Montreal) |
| June 23rd: | Detroit |
| July 7th: | France (Castellet) |
| July 21st: | Great Britain (Silverstone) |
| August 4th: | Germany (Nürburgring) |
| August 18th: | Austria (Zeltweg) |
| August 25th: | Holland (Zandvoort) |
| September 8th: | Italy (Monza) |
| September 27th: | New York |
| October 13th: | Europe (Rome) |
| November 3rd: | Australia (Adelaide) |
| November 16th: | South Africa (Kyalami) |





## IMSA BELL/HOLBERT VICTORS AT THE MIAMI 3 HOURS

Holbert and Bell guided their Porsche 962 to a slim victory at the Miami 3 Hours on February 24th. The winning combination beat Hobbs/Brassfield by just 5.17s, at the wheel of their March Chevy.

It looks as though the Porsche Lowenbrau's unlucky run has finally ended — happily!

Driving conditions remained dry and fine throughout the weekend. Pole position went to the Buick 85G, driven by Paul/Adam who covered the 1.85-mile circuit in 1m 21.154s with the Wollek/Foyt and Bell/-Holbert Porsche 962s filling in the grid slots behind. Although the race lap record was later established by Hobbs/Brassfield in the March-Chevrolet 85G, beating Bob Tullius's (Jaguar XJR 5) former race lap record of 1m 24.203s by 0.216s, they only managed to qualify in 8th position. The Jaguars' performances were far from being as brilliant as last year whilst the Mustangs excelled in GTO.

Holbert/Bell's win on the tight street circuit came following Pescarolo/Ballot Lena's problems and the retirement of Wollek/Foyt in the other 962 as they succeeded in getting past the two March-Chevys and Haywood/Robinson's Jaguar XJR5.

An unfruitful week end's racing for March who will have difficulty proving the reliability of their engines for IMSA-type sprints. Jaguar, too, are going to have to get down to some serious thinking before they make the trip over to Europe for the Le Mans 24 Hours. The next IMSA round will be staged at Sebring when March-Chevy will be taking on Porsche for another bout...

### RESULTS

**1. Holbert/Bell** (Porsche 962), 111 laps or 330.336 km/206.46 miles in 3 hours 00m 17s, at an average speed of 109.962 kph/68.7 mph, 2. Hobbs/Brassfield (March-Chevy), 3 hours 0m 22.23s, 3. Fittipaldi/Garcia (March-Chevrolet), 111 laps, 4. Haywood/Robinson (Jaguar XKR T), 110 laps, 5. Kalagian/Lloyd (March-Chevrolet 84G) 108 laps, 6. Busby/Knoop (Porsche 962), 108 laps, 7. Mead/Baird (Lola-Chevrolet), 107 laps, 8. Pescarolo/Ballot Lena (Porsche 962) 106 laps, 9. Lammers/Guerrero (March-Buick 84G) 106 laps, 10 Cowart/-Miller (March-Chevrolet 84G), 104 laps.

## V6 BUICK FOR CANAM

The 4400cc Buick V6 derived from the production model will be equipping all cars taking part in the Canam Challenge this season. It is not supercharged, but the fuel injected engine is said to muster a good 514 bhp at 7800 rpm.

The block is made out of cast iron and the cylinder heads of aluminium alloy. It tips the scales at 140 kilos (dry). Wiley McCoy, the well-known preparer from Detroit, is one of the few specialists in the matter who have been chosen by McLaren Engines to get the blocks into race trim. A kit comprising the Kinzler-type injection system, overhead cam shafts, springs, and push rods is now available for purchase.

## SERVICE POINT

### FORD RS 200 — EARLIER THAN EXPECTED

Ford's new Group B was due to make its appearance at the 1985 edition of the RAC but it seems more than likely that its maiden-WEC outing will be at the San Remo.

It will be entering rallies *hors classement* until the autumn and production will commence rapidly for the 200 models required for homologation purposes.

# COMMON SENSE PREVAILS

***There could be no better news than that the Monaco Grand Prix like the Monte Carlo Rally is back on the 1985 calendar. We are equally delighted that FISA president Balestre has persuaded both Ken Tyrrell and Jacky Ickx to drop the actions which they had brought against both FISA and himself in the civil courts. But the peace remains artificial and uneasy, and we suspect that the AC Monaco, Tyrrell and Ickx, would never have withdrawn their cases if they believed that they could have continued to exist in racing with their reputations intact. Instead, they swallowed their pride in return for the right, so graciously granted by FISA, to run their races, their teams and their careers.***

***As we said in this column in January, FISA seems to be oblivious to the needs of the spectators and sponsors in its rough-shod administration of the sport. Mr Balestre may be able now to claim victory over his nemesis Mr Boeri of Monaco, but later in the year will he or FISA be prepared to refund the air fares of fans who in good faith have booked holidays to coincide with what looked like being phantom Grands Prix in New York and in Rome ?***

***On the whole, international motorsport survives in its current state of good health despite (and not because of) its federation. Instead of fighting off lawsuits a stronger and more constructive governing body such as those which control golf and American football would have its schedules firmed up years, not weeks, in advance of its championship events.***

***Fortunately, the competitors seem to be able to do their job well, as witnessed by the reports in this issue of five new F1 cars for Rio on April 7. We regret that Stefan Johansson who is profiled in this issue, may not after all be racing this year in Formula One as a result of the withdrawal of the Toleman Team. We sincerely hope that a solution to Toleman's tyre supply problems can be sorted out, because to lose the Witney team's accumulated talents and knowledge would be as big a blow as the loss of the Monaco Grand Prix.***

## WHO GOES WHERE IN 1985

With the opening round to the GP F1 season drawing progressively closer, the teams have finally decided who will be driving their cars when the circus resumes activity on April 7th at Rio. The Lola/Beatrice team, however, with drivers Alain Jones and Alain Ferté, will be having their maiden-round a little later on in the year.

### McLAREN

1. Niki Lauda

2. Alain Prost

*Commercial Director and Team Manager:* Ron Dennis
*Engineering Director:* John Barnard
*Car:* MP4
*Engine:* 6-cylinder Tag Porsche P 01
*Tyres:* Goodyear

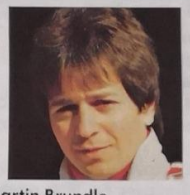
### RAM

9. Manfred Winkelhock

10. Philippe Alliot

*Director and Team Manager:* John McDonald
*Chief Engineer:* Gustav Brunner
*Car:* 03
*Engine:* 4-cylinder Hart
*Tyres:* Pirelli

### TYRRELL



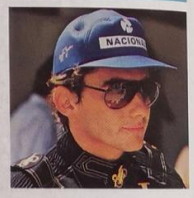
3. Martin Brundle

4. Stefan Bellof

*Director and Team Manager:* Ken Tyrrell
*Chief Engineer:* Maurice Philippe
*Car:* 012, then 014
*Engine:* Cosworth DFY, then Renault EF4 B
*Tyres:* Goodyear

### LOTUS

11. Elio de Angelis

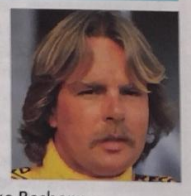



12. Ayrton Senna

*Director and Team Manager:* Peter Warr
*Chief Engineer:* Gérard Duracouge
*Car:* 97 T
*Engine:* Renault EF 15
*Tyres:* Goodyear

### WILLIAMS

5. Nigel Mansell



6. Keke Rosberg

*Director and Team Manager:* Frank Williams
*Chief Engineer:* Patrick Head
*Car:* FW 010
*Engine:* 6-cylinder Honda
*Tyres:* Goodyear

### RENAULT

15. Patrick Tambay

16. Derek Warwick

*Sports Director:* Jean Sage
*Chief Engineer:* Bernard Dudot
*Car:* RE 60
*Engine:* Renault EF 15
*Tyres:* Goodyear

### BRABHAM

7. Nelson Piquet

8. François Hesnault

*Team Manager:* Herbie Blash
*Chief Engineer:* Gordon Murray
*Car:* BT 54
*Engine:* 4-cylinder BMW
*Tyres:* Pirelli

### ARROWS

17. Gerhard Berger

18. Thierry Boutsen

*Director and Team Manager:* Jackie Oliver
*Chief Engineer:* Dave Waas
*Car:* A8
*Engine:* 4-cylinder BMW
*Tyres:* Goodyear




# Top cover for top people:

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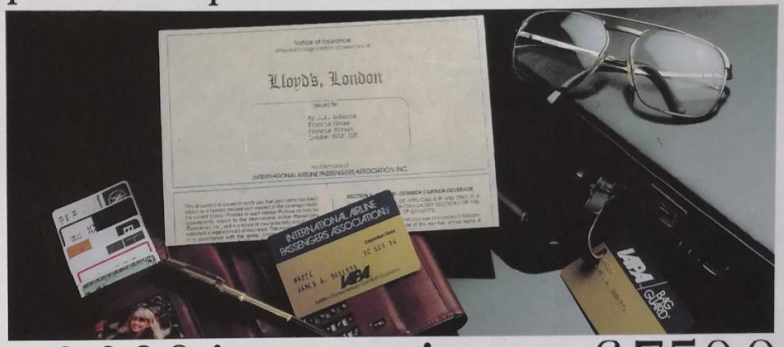


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## TOLEMAN

Toleman Motorsport announced on March 13th that they have ceased operating their Formula 1 motor racing team and cannot participate in this 1985 F1 World Championship.

*"It's a hard and soul destroying decision to take,"* commented the group's chairman Ted Toleman, *"but one which we're forced into. No-one, for reasons best known to themselves, is prepared to supply us with tyres following the withdrawal of Michelin from racing last year and with no tyres, companies are not prepared to commercially support the team."*

Toleman Motorsport have recently agreed terms with John Watson but it now looks as if Britain's most successful Grand Prix driver will not get the chance to race the car alongside Sweden's brilliant Stefan Johansson.

*"It's taken us four years to fight our way to the front of Formula 1,"* says Toleman managing director, Alex Hawkridge *"and now, just when we are in a position to win races, this happens to us."*

Toleman, whose cars finished 2nd at Monaco last year and 3rd in both the British and Portuguese races, stated that they can and would respond quickly should *"a miracle"* occur before the first race in Brazil on April 7th.

## SPIRIT

**21. Mauro Baldi**
*Director and Team Manager:* John Wickham
*Chief Engineer:* Gordon Coppuck
*Car:* 201
*Engine:* 4-cylinder Hart
*Tyres:* Pirelli

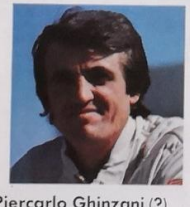
## ALFA ROMEO EURORACING

**22. Riccardo Patrese**

**23. Eddie Cheever**

*Directors and Team Manager:* Gianpaolo Pavanello, Munari
*Chief Engineer:* Giorgio Tonti
*Car:* AR 185
*Engine:* 8-cylinder Alfa Romeo
*Tyres:* Goodyear

## OSELLA



**24. Piercarlo Ghinzani (?)**
*Director and Team Manager:* Enzo Osella
*Chief Engineer:* R. Pedrotta
*Car:* FA 1G
*Engine:* 8-cylinder Alfa Romeo
*Tyres:* Pirelli

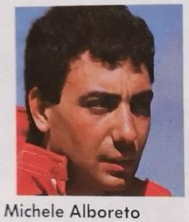
## LIGIER

**25. Andrea de Cesaris**

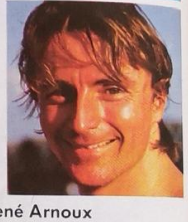
**26. Jacques Laffite**

*Sports Director:* Gérard Larrousse
*Chief Engineer:* Michel Tétu
*Car:* JS 24
*Engine:* Renault EF 15
*Tyres:* Pirelli

## FERRARI



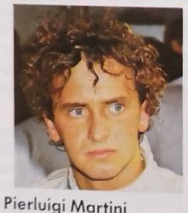
**27. Michele Alboreto**



**28. René Arnoux**

*Sports Director:* Marco Piccinini
*Chief Engineers:* Tomaini and Harvey Postlethwaite
*Cars:* 156/85
*Engine:* 6-cylinder Ferrari
*Tyres:* Goodyear

## MINARDI



**29. Pierluigi Martini**
*Director and Team Manager:* Giancarlo Minardi
*Chief Engineer:* G. Caliri
*Car:* M 185
*Engine:* 6-cylinder Motori Moderni
*Tyres:* Pirelli

## ZAKSPEED

**30. Jonathan Palmer**
*Director and Team Manager:* Eric Zakowsky
*Chief Engineer:* Peter Brown
*Car:* Zakspeed
*Engine:* 4-cylinder Zakspeed
*Tyres:* Goodyear

# BBS REWRITE THE STORY OF THE WHEEL. IN THREE PARTS.

This is the BBS RS 3-part wheel.

As you can see from the illustration below, it has a split rim, so it weighs considerably less than ordinary alloy wheels. True to form it also runs far, far more precisely. (After all, we build the wheels used by Porsche when they win Le Mans and by BMW on their very high performance 635 CSiM.)

The RS wheel is not only built to the most exacting standards possible, it's also built to BBS standards. So high are these, we insist on making all 32 bolts on the wheel ourselves.

We then drive it more than 1200 miles, carrying two and a half times the normal wheel load.

We simulate cornering 800,000 times at high speed. To gain the much prized but seldom awarded TUV approval from the German government, we need only have done so 200,000 times.

We then spray salt for 300 hours to be sure every wheel will resist corrosion. We even X-ray the centre looking for the minutest flaw. Finally, we give every wheel a two year guarantee.

Not surprisingly, the RS wheel is the only 3-part wheel to achieve TUV approval.

At £200 a rim, it's not only the best road wheel in the world, it's also the most expensive.

If it's any consolation, we spared no expense building it. (This is true of every wheel we build, even our very much less expensive range of standard alloy wheels.) As the distributors below will only too readily tell you.

BBS WHEELS & AERODYNAMIC COMPONENTS FOR AUDI, VW, BMW, MERCEDES, PORSCHE AND OTHER FINE MARQUES AVAILABLE FROM MAGARD (0533) 730831, MOTORTUNE OF BANGOR (0247) 465020, GTI ENGINEERING (0327) 857857, STRATTONS SERVICE (0625) 532678, ASTON MARTIN TICKFORD ENGINEERING (0203) 491010, AUTOSPORT & DESIGN 01-969 8353. UK CONCESSIONAIRES: KITZ GROUP (0908) 677808.

# RENAULT RE60 EVER HOPEFUL

**UNTIL HIS ARRIVAL AT RENAULT SPORT, THE NEW TEAM MANAGER GÉRARD TOTH, KNEW NOTHING ABOUT FORMULA 1 OR RACING CARS. HIS NOMINATION MEANS THAT HE BRINGS WITH HIM OUTSIDE OBSERVATIONS BUT HE MUST FORM HIS OPINIONS ON THE MATERIAL LEFT BY THE OLD TEAM.**

*by Patrick Camus*

Renault brought turbo technology to F1 and yet, despite more or less obliging other teams to copy their philosophy, have never clinched the world crown!

"*A well-organised internal team structure just isn't enough. It has to devote all its time and energy into producing competitive material,*" déclared Gérard Larrousse's successor when he took over. Few changes are being made to Renault Sport's team which will remain more or less as it is now as most of the engineers, technicians and mechanics are staying on. The drivers, too, Derek Warwick and Patrick Tambay, remain unchanged. The car itself is a natural development of the previous Renault F1 racing cars. Michel Tétu (who left the Régie last October for Ligier) was the man who began new drawing board designs for the RE60 as early as the beginning of last year.

"*Yes, the new car was thought out by Michel Tétu,*" Gérard Toth admitted, "*but, I must point out that quite a number of modifications have been made to the car since he left us. Michel Tétu's team and those who have come to replace him have proved themselves competent in taking over where he left off and in making the necessary modifications to produce an even better car.*"

Confidence is obviously a strong point in the Renault camp.

The main difference on this year's chassis compared with last year's concerns the suspension. It is now push rod operated to both the front and rear to improve on traction out of corners. Last year's troublesome gearbox has been greatly modified during the interim season. It is a 6-speed box with Hewland-Indy internals and Renault casing.

If development work had only concerned the suspension and gearbox, the new team manager of Renault Sport would have no real grounds for such optimism. However, the RE60 will feature a new engine. During the early part of the season, the new RE60 will be fitted with the old, but reworked, V6 EF4 and later the new EF15 will be fitted. This highly modified V6 power block's alterations include new bore and stroke figures of 80.1 mm x 49.4 mm instead of 86 mm x 42.8 mm which places it on an equal footing with the Italian and German 6-cylinder engines. The main advantage of having longer stroke and shorter bore is to improve on the quality of combustion and the reliability of the piston heads. Obviously the smaller the surface area the better the resistance to very high temperatures. Shorter bore also gave the possibility of improving on the internal cooling system. Total engine height on the EF15 has been lowered by 20 mm compared with its predecessor which affects the positioning of the admission and consequentially the height of the rear bodywork.

Unfortunately the problem with this latest V6 is that it is still has to go through the final development stages. Renault, as well as Ligier and Lotus, of course, will have to make do with an EF4"B" until it is ready. Renault Sport aren't saying much about their EF4"B" engine except that "*it's a lot more competitive.*" Perhaps it has been successfully mated up with the Renix electronic injection system. No interesting performance figures have been disclosed either. The Régie's not Ferrari. The only hint they have given is that the "*EF4's exhaust system has been revised so that new bodywork can be fitted and overall air-tightness has thus been improved on. The EF4"B" weighs in at 160 kilos with maximum revs at 12000 rpm.*

"*To quote a fellow constructor, I'd say that our engines 'develop' sufficient power. Both ourselves and our clients will have the V6 EF4"B" engine featuring between 30 % and 40 % of modified parts compared with the 1984 EF4. Most of the changes concern fuel consumption. The second version, the EF15, will then take over. Up to 80 % of the parts will be new. The bore and stroke ratio will also be different so that further progress can be made in terms of power and consumption.*" Indeed! So this EF4"B" isn't as satisfactory as Renault would have us believe! Who's going to be served first with the super V6? "*Our team will try the first new engine at the opening round of the season. We want to see how it performs. It'll only be brought in to replace the EF4 once it has proved its superiority. The first EF15 will be for Renault Sport, followed by one EF15 for each client, then two EF15s for Renault and then two for both Lotus and Ligier.*"

The tough part will soon start. Warwick and Tambay are visibly impatient. "*We've had trouble in adapting to the Goodyears,*" Tambay told us. "*We still have a great deal of work cut out for us until we get the settings just right but I feel confident that we'll be ready for the Brazilian GP on April 7th.* Patrick pulled out a coin from his pocket and tossed it in the air. "*Who's going to get the new engine at Jacarepagua? Me!*" he cried, pushing the coin back into his pocket. Warwick laughed. Long may he do so! ■

### No 1200cc engine

Unlike Ferrari, Renault has no definite plans for a turbo 1200cc engine at the present time in preparation for the rule change in 1988 which puts an end to 1500cc engines. Gérard Toth told us that, "*We have started thinking about the new 1200cc engine size ruling and for the moment we are at the stage of deciding if a 4-cylinder or 6-cylinder engine is best suited. Both have their advantages and their failings. We are keeping an open mind.*"

### TECHNICAL CHARACTERISTICS

**Type:** RE60.
**Bodywork:** Carbon/ kevlar and honeycomb.
**Chassis:** Carbon/kevlar monocoque.
**Brakes:** Carbon SEPs with Renault-made calipers.
**Suspension:** Rear and front - double wishbones with push rods and rockers.
**Gearbox:** Hewland-Indy internals, Renault casing. 6-speed + reverse.
**Dimensions: Wheelbase:** 2,800 mm, (RE50: 2,680 mm); **Front Track:** 1,800 mm, (RE50: 1,820 mm); **Rear Track:** 1,650 mm, (RE50: 1,667 mm).
**Weight:** 540 kilos.

# HOT OFF THE FIRE FERRARI 156/85

**ENZO FERRARI'S LATEST CREATION WAS RECENTLY REVEALED TO THE PRESS AT MARANELLO. THE OPERATIVE WORD THIS YEAR IS 'CONFIDENCE'. CONFIDENCE THAT THE TEAM HAS PRODUCED ITS VERY BEST.**

*by Patrick Camus*

One of the perks in the life of a Formula 1 journalist is being able to meet Mr Ferrari at home. Before we go into the details of his latest creation, it seems an appropriate moment to congratulate him on yet another wonderful welcome and a happy 87th birthday. Don't forget, Ingegnere, that you promised us something special for the Roman GP!

Having said that, the reason behind our visit to Maranello, apart from paying our respects to the living legend himself and taking up some of his valuable time, was to get a close look at the new 156 which has been created especially for the 1985 F1 championship. The first question that naturally springs to mind is why call it the 156 and not 126C5? Cunning Ferrari's reply: *"I don't think it's very wise to call a new girl friend by the former's name, is it!"* The second question, why had we been invited to a Saturday baptism? To prove that Ferrari was on the go every day of the week? You couldn't be more wrong. It was simply to coincide with the Commendatore's birthday. Although the overlord's birthday has always been celebrated on the 18th February, he was actually born on the 16th of that month, in 1898. His parents only registered his birth two days later.

## COMPUTER TECHNOLOGY

After such a disappointing 1984 season, a great amount of work had to be carried out by the Scuderia. Everything from the tyres to the engine to the aerodynamics was revised. The design bureau thought it would be advisable to redesign the car, using the C4 as the basis rather than risk tackling a radical change. Better the devil you know than the devil you don't know! The engineers also featured some of the technical improvements that had already been made to the C4. At the Rio tests the C4,5 which was being used, beared more than a faint resemblance to the 156. Research work progressed in leaps and bounds thanks to computer technology on the 156. The conceptualisation of the entire car (suspension, tub, bodywork, resistance of the various materials) was the result of precious data which had been kindly 'leant' by the Italian fighter plane company Aermacchi. Ferrari thus saved an incredible amount of time and also reduced the error margin considerably.

Although obviously a direct descendant of the previous chassis, this 156 does feature a few new and interesting characteristics — built-in water tank for the injection, lowering of the centre of gravity and most importantly the use of new composite construction materials together with the now familiar carbon/kevlar combination. Boron is a hard metalloid from the carbon or silicone family, and increases rigidity and safety as well as being lighter. The 540-kilo minimum weight limit has been achieved with little difficulty since the car has been generally lightened all over. The specification sheet gives the car as weighing in at 548 kilos with full fuel and oil tanks and classical steel discs. Once the carbon SEP discs are fitted, the car will be down to the minimum authorised weight.

Double wishbone and pull rod suspension units have been fitted to all four corners, as previously on the C4 before Forghieri mounted the rocker and push rod combination. The very wide base rear wishbones have a dual mounting point on the gearbox and a cast part. The spring/damper units which had been placed on the end of the gearbox are now mounted on either side of the magnificent spacer-cum-oil tank.

## NEW LOOK MECHANICALS

All the really interesting innovations are hidden either under the engine cover or under the side pod fairings. So, the V6 has been rethought has it? Yes, it has, despite the bore and stroke remaining unchanged at 81 x 48.4 mm. The Italian V6 has been profoundly modified (see GP! No 90), a new cylinder head has been designed which entailed replacing the turbos and spaghetti-like exhaust system by the admission! This layout means that all the V6s out on the F1 circuits are identically set up and obviously leads to improved dynamics and a better weight distribution. The admission and nearby electronic injection now fit in easily thanks to the 120 degree Vee. A real engine cover is now also featured. In view of the lower profile of the car, the rear wing is no longer affected by turbulence problems. A second advantage is that the exhaust and heavy supercharging system now run down either side of the V6. The centre of gravity is also lower as a result, which in turn improves on traction, the C4's weak point last season.

Lastly, the exhausts (one outlet per cylinder row) now exit through the flat bottom which thereby increases the venturi principle of the bulky rear extractor fairing.

Whether on the test bench or out on the track, the revised version of the V6 isn't any more powerful or more flexible than its predecessor. That wasn't the idea behind revising the car at all. 12000 rpm at maximum revs, 11500 rpm for testing, 780 bhp at 11000 rpm in racing configuration (boost pressure set at 3.5/3.6) and approximately 900 bhp for qualifying (boost pressure set at 4.2).

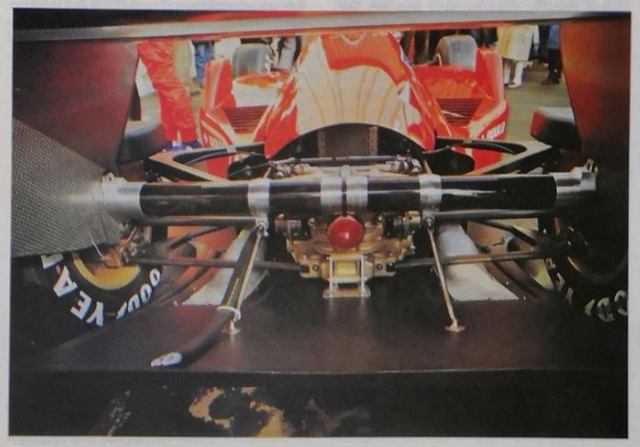
## AERODYNAMICS AGAIN!

***The main modifications concern the rear end of the 156. Nothing has been kept from the 126 C4.***

***This year, an engine cover has been fitted and streamlining has improved through the repositioning of the turbos on the sides of the V6.***

Turbulence to the rear wing has been lessened as a result of the lower and smoother profiling. The aerodynamics were changed entirely with the construction of the side pods. The nose section is slimmer, the bodywork is McLaren-inspired and a real engine cover is also featured which means the Ferrari will no longer be the odd car out amongst the other circus single seaters. The radiators are set on edge forming a Vee with the open end towards the front. Rear wing turbulence is again reduced as the hot air from the turbocharged engine exits laterally instead of vertically. Vertical intercoolers have been positioned behind the radiators, together with the turbos and their periscope-like upper air inlets. Since their return from Rio, Alboreto and Arnoux still haven't had a drive in the definitive version of the 156 as intensive comparative testing between the C4 and C4,5 featuring all the major 85 modifications, is still underway. Arnoux had this to say about the new car — *"The most important difference is the weight. Our lab chassis tipped the scales at 580 kilos whereas the 156 should weigh in at 540 kilos once the carbon discs are fitted. Not bad when you consider that the tub itself is actually heavier than last year's! The car is altogether much slimmer and traction out of the corners has improved. In my opinion, I think we should have gained a good second a lap. Now it's a question of waiting to find out what exactly McLaren, Williams and co have conconcted this winter. It looks like this is going to be a highly competitive season."*

The McLaren drivers are the first to admit that Ferrari will be amongst the forerunners. They also have the great advantage of their Goodyear experience. At the time of going to press there was just one embryonic version of the 156 which the two Ferrari boys have started testing at Fiorano. Once the construction of the second chassis has been completed, it'll be on to Rio where the tyres and engines will go through as severe a beating as anywhere else in the world of F1. Until the season gets under way on April 7th (at Rio), we'll be kept with bated breath to find out just how good the striking red cars really are. Perhaps this will be another lucky year for Ferrari — logically their turn has come round again. ■



### Technical description

**Type:** Ferrari 156/85.
**Engine:** V6 at 120 degrees. **Bore and stroke:** 81 x 48.4 mm. **Engine size:** 1496.43cc. 24 valves. **Compression ratio:** 7:1. Twin KKK turbochargers.
**Horsepower:** 780 bhp at 11000 rpm for race and 900 bhp for qualifying.
**Injection:** Digital Weber Marelli electronic injection system. Agip water injection. Electronic Marelli ignition.
**Transmission:** Transversely mounted Ferrari 5-speed + reverse with independent oil tank. Limited slip Z F differential.
**Chassis:** Carbon fibre/kevlar and honeycomb monocoque. Computer-designed.
**Suspension:** Front — double wishbone with pull rod; Rear — lower wishbone with upper tierod and pull rod. Driver adjustable front and rear anti-roll bar.
**Dimensions:** 156/85 (126 C4 dimensions in brackets).
**Wheelbase:** 2,762 mm (2,600 mm).
**Front track:** 1,797 mm (1.790 mm).
**Rear track:** 1,663 mm (1,644 mm).
**Length:** 4,292 mm.
**Width:** 2,135 mm.
**Height:** 1,080 mm.
**Weight:** 584 kilos.

# HERE IT COMES!

**A CHITI ENGINE? IMPOSSIBLE. HOW CAN ANYONE DESIGN AND CONSTRUCT A F1 TURBO ENGINE IN JUST FOUR MONTHS. NO, I SAY IT'S JUST NOT POSSIBLE. WELL, IT IS AND THE CHITI V6 ACTUALLY EXISTS. IT WAS PRESENTED ON THE STAGE OF A CLASSY ITALIAN NIGHT CLUB WHERE IT SAT GENTLY TICKING OVER FOR ALL TO ADMIRE.**

*by Patrick Camus*

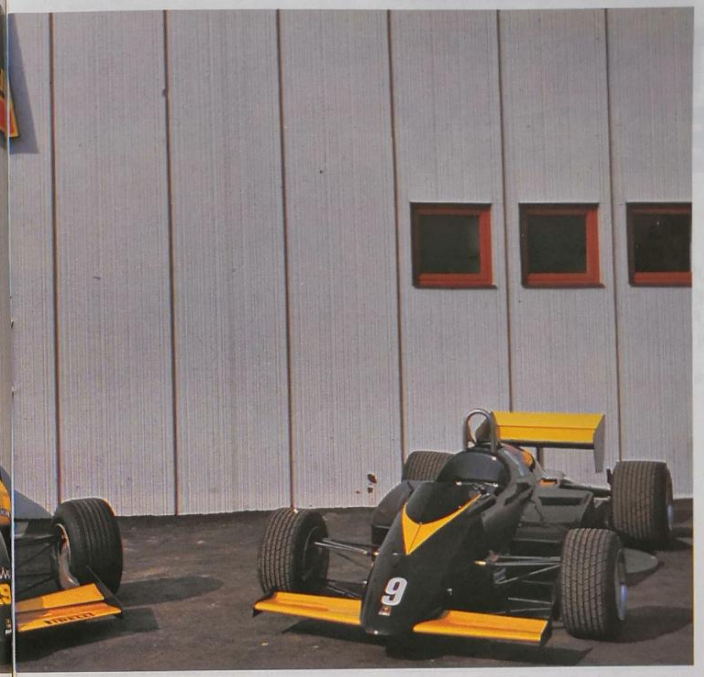
Imagine the scene: a sumptuous vast night club somewhere in the suburbs of Faenza packed with more people than even Cliff Richards could attract. Racing cars are whizzing by on video screens carefully placed here and there and lazer beams cut through the dense atmosphere of cigarette smoke. Suddenly, the whole place was filled with the sound of music, Wagner's Walkyrie. It was so loud that the loud speakers were trembling. The air was tense with anticipation as the curtains slowly opened to reveal two single seaters. The Minardi F3000/Cosworth and the F1 Minardi M185. Then, the mechanics appeared from behind and slowly walked forward in time to the music to form a semi-circle around the two silent cars. One of them bent over the gearbox, another over the engine. With no fuss whatsoever, the Chiti V6 started up and lay there gently humming away as the air filled with the smell of exhaust fumes. The crowd clapped enthusiastically. Beside me, an Italian journalist wiped away a tear! *"I can't believe it! This is the first time that this engine has ever fired up. They brought it here and hey presto! That guy Chiti is amazing, absolutely amazing!"* Well, don't let's get too carried away about this. Just for the record, the engine had received the finishing touches the night before at about 10 pm. By 2 am, Carlo's industrious team had assembled it into the Minardi chassis and had obviously rehearsed the scene a couple of times too, to get it just right for maximum impact with the Italian public. Mission accomplished.

At the age of 61, Carlo Chiti is still an imposing figure and he undoubtedly still has a few surprises in store for us. He was caught up in a ridiculous political situation and lost his Autodelta chairmanship (Alfa Romeo competitions department). Just when everyone thought he was going to accept retiring gracefully in a comfy advanced R & D bureau (like Forgieri, you say), he most unexpectedly gave in his notice on the eve of the Portuguese GP and set off for a new venture. In reply to Euroracing's attempts to jeopardise his professional career, Chiti riposted by hitting hard — and right where it hurt most! To begin with, the Minardi was to feature a turbo V8 Alfa engine and he received two for the winter testing programme. However, it wasn't long before Alfa withdrew their offer. Within a few days, Minardi, Chiti and Mancini, the mint master, got together and put together a new project. They would create a new engine. It was as simple as pie. In no time at all, the factory and offices were set up. Chiti hired on seven full-time designers for his drawing room and five 'free-lancers' working independently. A dispatch boy would collect the plans and designs one by one and take them along to the sub-contractors. To most it would seem the work of a miracle, but not to those who are familiar with Chiti's working methods. Even at Alfa he worked in the same way. In all, about ten specialists were in on the final phase plans of the Chiti club V6. Each man had his pistons or his crankshaft or his block to look after, the *raison d'être* that so typically characterises the Italian way of life.

Chiti readily admits that the V6 90° engine is Porsche-inspired and the general shape oddly resembles the V8 Alfa. Unsurprising really when you learn the mould is identical! *"Yes, but we have changed a certain number of things like the combustion chambers, the water circuit and the lubrification. We have set ourselves the target of finishing the races this year, not of winning them. That will have to wait until 1986 when we will be able to work out an extensive development programme."*

There are no precise figures as yet. Chiti believes that 720 bhp should be available in race configuration according to the drawing room calculations as the engine was only due for testing on the bench two days after the presentation.

Chiti's main headache, which he shares with all the other teams, is to try and solve the fuel consumption requirements of his engine. In view of limited cash supplies, the simplest solution lay in featuring an electronically-controlled mechanical Bosch Kuglelfischer injection system which has already proved its reliability but is perhaps not as efficient as the latest technological developments in this field. It is hoped to fit the V6 with a more sophisticated Marelli Weber device — if Ferrari gives the go-ahead, of course. Fortunately, Carlo and Enzo are old buddies. Not long before Chiti resigned from his job as the chairman of Autodelta, he paid his ex-employer (from 1957-1962) a visit. *"I wanted to know what he thought of my project. He advised me to go ahead at full speed. He convinced me that I was right."* Chiti feels that at 61 he has been given a new lease in life.




## MINARDI
## WE ALL BELIEVE IN IT

He won't tolerate anyone suggesting that this is his way of taking revenge for the Autodelta and Alfa Romeo problems. All that's buried in the past now. Euroracing, too. The team from Pavanello will be considered as his adversaries, just like any other team. *"If I really wanted to settle old scores, I wouldn't go about it like this. I'd be waiting, stick in hand..."*

The team is convinced of the feasibility of the project and they of course realise that there is still much work left to be done. *"We were amongst the first teams to officially enter the 1985 championship,"* Giancarlo Minardi pointed out, *"which proves our firm intentions and the sights we have set ourselves. We've obviously a great deal, if not everything, yet to learn. We are going to do our homework dilligently and carefully."* First things first. The Minardi team has to buckle down to improving its material. The M185 is an attractive well-finished car. It is the fruit of the latest developments in F1 technology (aluminium/carbon kevlar monocoque, the bodywork has been tested through the Orbannano Fiat and Pininfarina wind tunnels), but when examined closely, there are a couple of things to clear up. Firstly, the internal air flow is visibly inadequate. The weak point of turbo-engined power units is precisely the efficient evacuation of the calories (from both the water radiators and the intercoolers). Engineer Caliri is going to have to remedy that problem in time for the boiling hot driving conditions at the Brazilian GP. Pierluigi Martini the young Minardi driver admitted that, *"The car's development programme includes the repositioning of the entire turbocharging and cooling systems. The plans are finished now, but we haven't had time up until now to test them, not having the engines. We have had to make do with rolling tests using the V8 Alfa. We're going to get down to the hard part now but I feel quite confident about the whole thing. The chassis appears to be relatively well-designed and responds well to changes in basic settings. We're not going to rush into this season like a bull in a china shop just because there's only a couple of weeks left. We're going to be careful and methodical. If I manage to qualify for a starting place on the grid at Rio, believe me, the Rio Carnaval will be taking place in the Minardi pits and not on the beaches of Copacabana!"* Let's hope that it will.

### F3000 in orbit

The twin groups Minardi Team and Motori Moderni are directed respectively by Messrs Minardi/Mancini and Mancini/Chiti who have decided to tie a second string to their bow for 1985 — F3000. And not in any old fashion either. The Minardi chassis will be featuring a normally-aspirated Chiti engine!

The 1984 F1 aluminium carbon monocoque chassis was used as a basis. To the front there is a double wishbone with pull rods and to the rear the suspension is rocker-operated. The bodywork is classical with side pods and tightly-waisted rear portion. The most interesting feature lies under the engine cover. The first of the Minardi F3000s was presented with the classic Cosworth power block but Motori Moderni are at present working on a new block derived from the Lamborghini Jalpa. *"Our company signed a contract for a collaboration with Lamborghini which gives us the right to create a special F3000 engine derived from the V8 four valves per cylinder, featured on the Jalpa. Apart from the usual procedures necessary in the preparing of an engine for competitions, we had to reduce the engine size by 500cc,"* pointed out Carlo Chitti. Naturally, Minardi will be receiving the engine as soon as it's ready, but deliveries will commence in July for any other teams interested in purchasing them. The price is not too steep when you consider that the tag on the F1 turbo V6 reads one million Liras. You can be sure that AGS and the others will be quick to jump in!

### TECHNICAL CHARACTERISTICS

Minardi M185.
**Engine:** V6 Motori Moderni.
**Chassis:** Aluminium, carbon and Kevlar sandwich monocoque.
**Gearbox:** 5-speed Minardi M101 + reverse.
**Suspension:** Front — double wishbone with pull rods; Rear — double wishbone with push rods and rocker. Spring damper unit.
**Brakes:** Steel Brembo discs.
**Tyres:** Pirelli.
**Dimensions: Wheelbase:** 2,607 mm; **Front Track:** 1,812.7 mm; **Rear Track:** 1,661 mm.
**Weight:** 550 kilos.

### TECHNICAL CHARACTERISTICS

V6 Motori Moderni.
**Type:** V6 90°.
**Bore and stroke:** 80 x 49.7 mm.
**Engine size:** 1489.9cc.
**BHP:** 720 bhp at 11300 rpm with boost pressure set at 2.2 bars.
**Torque:** 67 mkg at 9000 rpm.
**Maximum revs:** 12000.
**Compression ratio:** 7:1.
**Turbochargers:** Twin KKKs.
**Ignition:** Electronic Magnetti Marelli Raceplex.
**Injection:** Electronically controlled mechanical Bosch Kugelfischer.
**Distribution:** Four belt-driven overhead camshafts. Four valves per cylinder.
**Construction materials:** Aluminium alloy block, titanium alloy rods; forged steel crankshaft.
**Engine weight:** 147 kilos (with turbos and waste gate).

# OATHS AND PERJURY

**SO, KEN TYRRELL HAS RENOUNCED HIS OLD BELIEFS. HIS CONTRACT WHICH NOW BINDS HIM TO RENAULT HAS SURPRISED ONE AND ALL IN THE WORLD OF FORMULA ONE. THE SELF-CONFESSED CHEAT HAS DECIDED TO MEND HIS WAYS BY PLACING HIS FAITH IN RENAULT POWER. BYE BYE COSWORTH.**

*by Patrick Camus*

***History is continually repeating itself. Here we show the six-wheeled Tyrrell/Renault turbo of 1976!***

*"Renault Sport is pleased to announce that it will be supplying Tyrrell Organisation with its turbocharged engines. The contract has been signed for 1985 and 1986."*

A small time constructor and important FOCA personality was going to receive his power plant from a state-owned constructor! A legalist was going to rescue a cheat from his plight! The whole affair's tainted with subtlety: a case of "*When you can't beat them, join them.*"

Tyrrell team's association with his friends on the other side of the Channel goes back some ten years now when he sported the French oil company Elf's colours. During that time some of the most exciting pages in the history of motor racing were turned. Remember the 1968 Dutch GP when for the first time in 14 years a French F1 car was first over the finish line. That, of course, was the Tyrrell Matra Ford driven by Jackie Stewart. The same trio clinched the world title the following year. Matra then altered their sights in 1970 and put everything they had into their own 3000cc V12, whilst Stewart's allegiance to the Cosworth engine remained true. Tyrrell then decided to go it alone and with the French oil company created Elf Team Tyrrell. Big Ken was refusing the Matra V12 in favour of the British V8? Whatever the reason behind this whim he soon became the best talent scout ever. What French driver hasn't driven for Tyrrell? Johnny Servoz-Gavin, François Cevert, Patrick Depailler, Didier Pironi, to name but a few, all graduated from the Tyrrell school of driving. Others stayed just for a GP whilst others signed for one or more seasons, Leclère, Jabouille and Jarier. The French connection was Tyrrell and he was out there on his own until, without warning, the wind changed. Claude Haardt, Jean Terramorsi and François Guiter began revealing their plans for a 2-litre V6 in 1972 and then for a turbocharged version in 1974 to take part in the WEC. This last project obviously also concerned F1 with engine size being reduced to 1500cc. This engine first began testing on November 18th, 1975 whilst at the same time a lab Alpine A500 single seater concocted by the valiant Dieppe boys had its first outing on the Michelin private test track. Things didn't really get off the ground until July 14th, 1977 at Silverstone. Guess why it took so long. Because the Renault turbo had been planned to start its career on an already established team — Tyrrell's in this case — but big Ken refused to honour the contract he had signed! "*How on earth can you expect a turbocharged 1500cc to develop more power than a normally-aspirated 3000cc. Don't expect me to swallow that one! Only the French would believe something as idiotic as that. Cosworth and Fuhrmann from Porsche think the whole idea's completely ludicrous.*" With that, Tyrrell popped the contract into his bottom drawer for a rainy day until Renault could prove the superiority of their material. In due course, the French company's patience was rewarded by dint of the colossal sums of money that were invested. What annoyed Tyrrell most at that time was not Renault, who were to cope with different problems every season, but Ferrari. Their turbo came out in 1981 and won the World Championship the year after! Business was business, no doubt about it. Turbo philosophy, too, annoyed Tyrrell. Any constructor, if he had the means and an engine, could take part in F1 GPs and waltz away with the title. Tyrrell pannicked and also got all at FOCA into a state of panic too. He didn't believe for a second in the Renault turbo. Every time a piston blew or a valve got chewed up he'd poke fun at the Renault engineers. The V6 from Viry proved it was more or less reliable but by that time Tyrrell's contract had run out. Then Ferrari arrived on the scene with a turbo, and then Hart. Treason! A Brit with a turbo! Enough was enough! FOCA must now step in and put a stop to this invasion of turbo technology which would ultimately ruin Cosworth and other small British constructors. A meeting was convened and an oath taken. All for one, and one for all. What about Ecclestone, Dennis, Chapman and Williams? Were they too against the era of the turbo? Of course, they'd said they were, hadn't they? Tyrrell was feeling invulnerable with all his good friends alongside him in the same boat. During his anti-turbo campaign, Tyrrell could be both funny or pathetic to watch. Funny when both he and his friends decided to cheat on the minimum weight allowance by fitting a liquid cooling system to the brakes. Pathetic when he went to Imola whilst all his pals had voted to boycott the race. He said that he'd gone to honour his sponsors but was in favour of FOCA's decision to boycott. To prove his point he put in a protest against Ferrari and Renault for "*illegal turbine-powered engines*". His protest was not accepted. Tyrrell was not going to be put off like that. He was furious and in his blind rage he took his protest to the FIA's Court of Appeal — where it was again rejected. Yes, Ken was blind alright. He didn't even see that FOCA were trying to give him the slip. And he was the central figure! Bernie Ecclestone the FOCA president had signed a contract with BMW, Williams with Honda, McLaren with TAG Porsche, Lotus and Ligier with Renault. Nothing like putting your own personal interests before anything else! Poor old Tyrrell found himself very much alone. But that was without reckoning with wily Ken. He wasn't going to be outdone. He'd carry on with his fight. He filed a protest against the water injection system on the Renaults and Ferraris. That, too, was rejected. Tyrrell saw red whenever turbos were mentioned. Yet another protest was discarded at the Hockenheim GP. The Court of Appeal declared that it was not competent to deal with such matters and sought advice from an Austrian professor. "*We cannot consider water as an additive. Therefore this system does not go against the rules and regulations governing F1,*" came the reply. Tyrrell shrugged his shoulders. His fellow comrades were bored with his stuborness. "*So, our fuel's illegal, is it?*" asked François Guiter who supplied the Tyrrell cars with fuel and oil; for old time's sake. If that's what he thought, he could find himself another supplier. He was through with Tyrrell.

On the eve to the new 84 F1 season, all the teams had turbocharged cars. Except one. Ford had been mentioned for the odd man out, but the engine wasn't ready. Renault, too, but Larrousse had given his veto, perhaps bearing a grudge for the breach of contract in 1976. Rumours for BMW and Japanese engines also went round amongst others. But, no-one was behind Tyrrell at the end of the day. In order to survive, Tyrrell had no option left but to cheat. If turbo technology could beat the rule book, then so could he! After all he had a lot less power than everyone else! Underhandedly he added 70 kilos of ballast to his cars in the form of lead pellets a few laps before the chequered flag came down. He also 'doctored' the fuel by injecting "*an unidentifiable liquid containing traces of hydrocarbons*". His contriving was brought to an end at Dallas when he fell straight into the trap he'd been set. Tyrrell was banned, taken to court and his sponsors disappeared into thin air. He was doubly guilty in that, in the eyes of FISA, not only had he gone against the rules of the game but he hadn't honoured his word of July 25th, 1984 whereby he had accepted not to take the Federation to court whilst his cars were racing, championship qualifying events or not. Tyrrell had had about as much as he could stand. His pride was shattered. He went over to Paris in order to try and work out some kind of agreement. "*I admit my errors. Let me race with a Cosworth, minus the 60 kilos.*" Now that turbo-powered engines develop almost 1,000 bhp it looks like the Cosworth's time has come for a graceful retirement from the F1 scene. Who would lend a sympathetic ear to Tyrrell's plight? Who would be crazy enough? Hart? Would he come to the rescue of another lost cause? No way! Unless he got Bellof and Goodyear for his four-cylinder engine! Anyway, Tyrrell was really after a well-proven turbo engine with room for development and an excellent after-sales service. A Renault would fit the bill! He decided to mention it the next time he met up with his ex-partner François Guiter. Larrousse had always slammed the door in his face each time he'd reveal his projects. It was worth giving the new boss a try, nothing ventured nothing gained, as they say! "*I have always been on good terms with Ken*", Mr Guiter explained, "*although I was angry with him when he brought charges against us. He wouldn't listen to reason. But we're all together in the same game whether its Renault, Elf, Tyrrell or anyone else. So, what's the point of picking quarrels like that? We've both been in motor racing long enough, twelve years! Not long ago he asked me to speak to Gérard Toth, which I was only too happy to do for him. There were two important points to consider for an agreement of this kind. Firstly, for Renault it meant a viable business deal and, secondly, it entailed that French drivers would again be given the chance of working their way up in the world of racing with Elf.*" The lawsuits were quickly forgotten as Tyrrell of the F1 underground service became Tyrrell the straight-guy and friend of the top constructors. Once he'd got his V6 turbo into the rear end of his cars he wasn't going to start with his accusations all over again, they hoped. "*I'll tell you something.*" Guiter continued, "*all those court cases showed up a typically British approach. It was fairly obvious that someone was backing him discreetly. All the FOCA people were right there behind him. It's worth adding, too, that soon there'll be a shortage of turbo engines. BMW will pull out in the not too distant future. Ferrari don't sell theirs and Alfa are going through hard times.*" (Here at GPI we do not see the future looking so bleak in view of various projects in Japan, Italy and the States, etc.)

Back to Renault. What are we supposed to make of this astonishing (to say the least) contract. Is it a gambit on Gérard's behalf to accept what up until then had always been refused? This seems quite possible in view of the fact that Toth has nothing against Tyrrell. However, more plausible, is the commercial aspect of the deal. A new client, means an extra million pounds in Renault Sport's kitty. A further million pounds to invest and that much less to beg off Renault. An extra client, is a step in the right direction. Another very good reason why Renault Sport should stay in F1. Or a very good excuse to quit. It depends whether they want to win races of sell engines.

This is what Gérard Toth had to say: "*I agreed to signing this contract for three very good reasons. Firstly, in a bid to end all the fuss that has been kicked up around the Tyrrell affair. F1 is so competitive and so exacting that instead of tearing each other to pieces we ought to try and help each other more. I know that some people actually enjoy adding fuel to the flames. I'm more in favour of extinguishing the fire and helping out. The second reason is more personal. The more clients Renault has, the more money is available for our F1 engine development budget. As you know, it's an extremely costly business and I prefer to rely on sources from several clients rather than just one. And thirdly, the more teams using Renault power, the higher our chances are of winning. Bearing that in mind, Tyrrell came to me and not the other way around. I'm learning the ropes of F1 racing and have come in from the outside. From where I stand, it looks as though the Tyrrell affair is now something of the past. Past history has nothing to do with me. My only concern is for the present and I work towards the future. The first thing I did when Tyrrell came to see me for a possible collaboration was to immediately ask Bernard Dudot to find out if it was logistically feasible. We'll be increasing our workforce, hiring on new engineers, setting up an extra test bench and we'll cope.*" Does Toth believe that his old clients have clearly understood the reasons behind this move? "*They didn't take to it very well at first, admittedly. But they quickly came to see the advantages and are totally in favour of it now. So are our partners.*"

The Renault/Tyrrell contract binds the British team in the same way that Lotus and Ligier are bound to the French constructor, ie, the lump sum includes the hiring and rebuilding of a given number of V6s. It now looks as though the Régie with its eight motors out of 26 at the start is striving to acquire the monopoly of the GP circus which once belonged to Cosworth. The late Claude Haardt's prophecy when he helped push Renault into joining the F1 scene is perhaps going to come true. ■

# ARROWS' HOPES SOAR

THE MECHANICS WERE BUSY APPLYING THE FINISHING TOUCHES. DAVE WASS THE ENGINEER WAS PACING AROUND NERVOUSLY AND THIERRY BOUTSEN WAS ONLY TOO ANXIOUS TO GET IN BEHIND THE STEERING WHEEL OF THE NEW ARROWS A8/BMW. IT WAS ONLY A MATTER OF MINUTES NOW...

*by Pierre Van Vliet*

Thierry Boutsen was standing staring at the rain through his hotel window near the Paul Ricard circuit in the south of France. It didn't look as though the ominous dark clouds would disperse in a hurry and he had got used to the idea that he was going to try out the new F1 turbocharged Arrows A8/BMW on a wet track. *"We would really have preferred to test the new car near the factory in England. Unfortunately the weather is even more unpredictable over there than here. Now that we're here we want to make use of every precious minute. We've got to find out what the weak points are to further our development programme."*

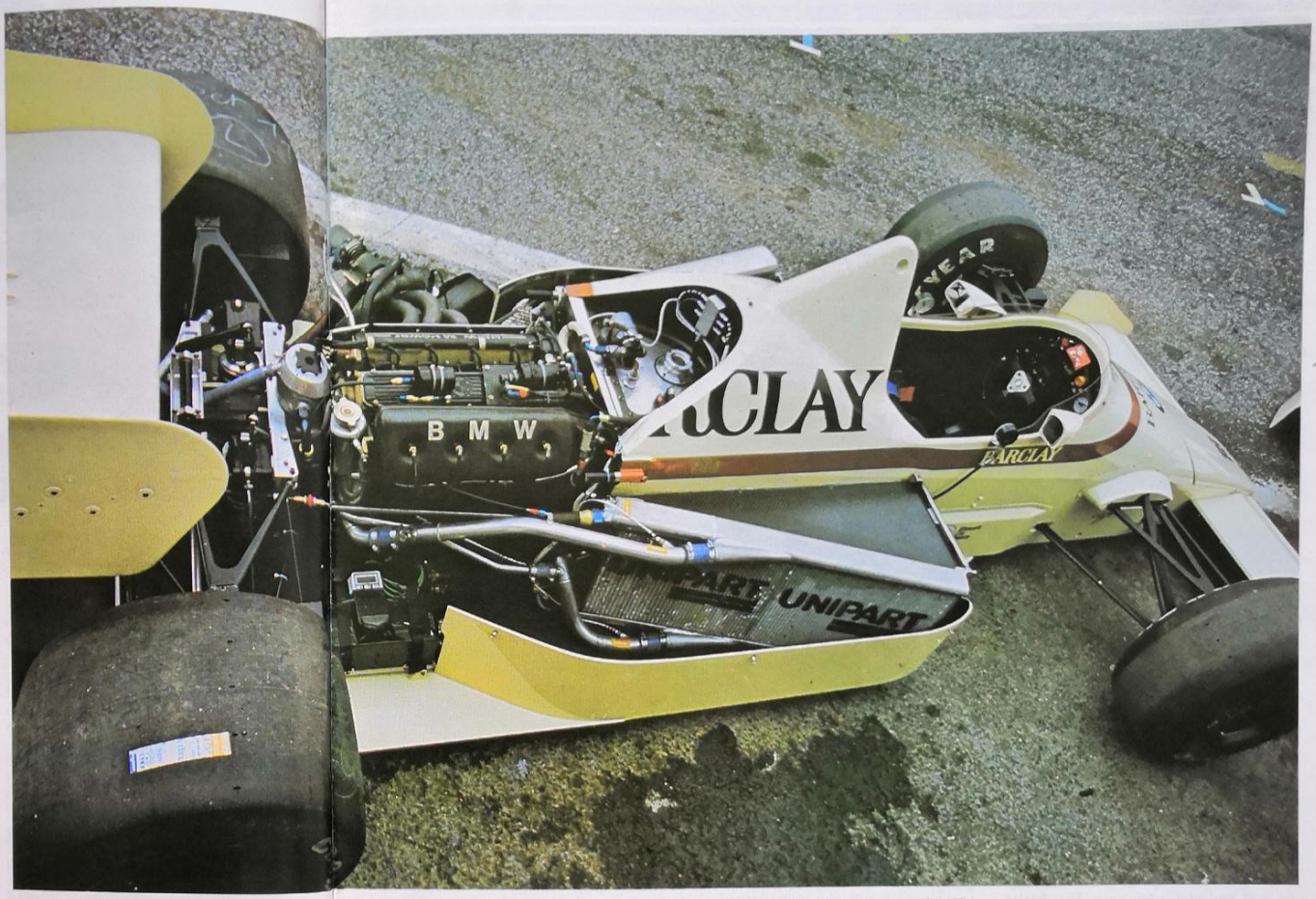
The Arrows team was not present at the first week of the Rio tests and development is behind schedule.

## SECOND GENERATION

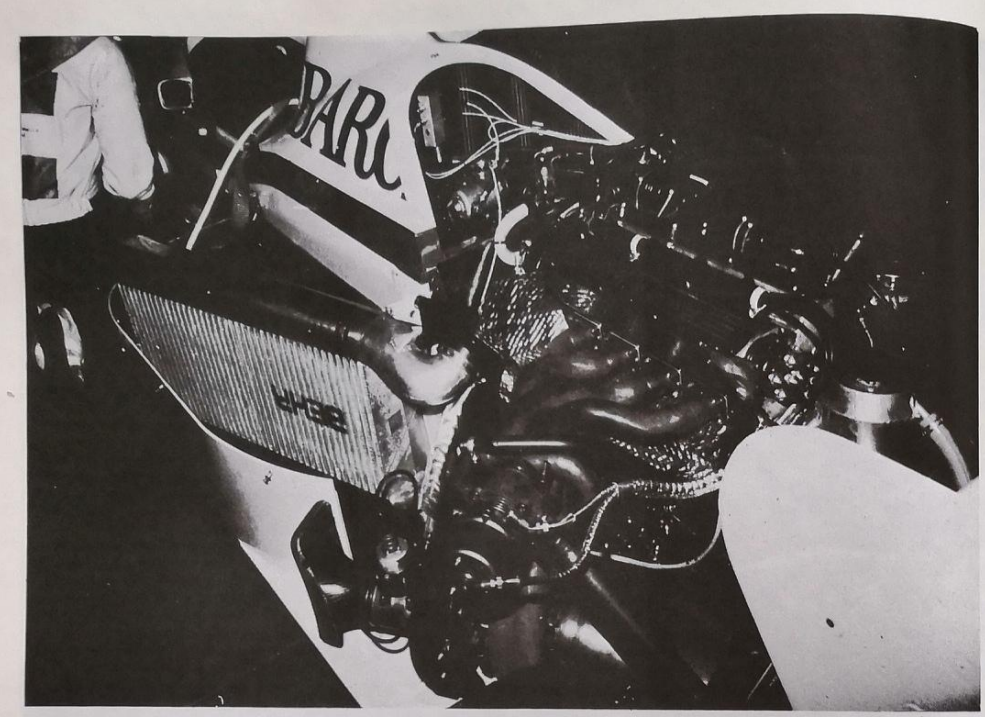
*"One thing's certain, I've got a competitive car and I'll have two new chassis by the first GP. 1985 looks as though it will be a much better year for me than last."*

The British team had to start last year's championship with old normally-aspirated Cosworth engines. Designer and construction chief Dave Wass was given the problem of adapting the old car to withstand the strain and stress of a turbo engine. The Arrows A7 was an intermediary car, something of a compromise. It first appeared on the GP scene in April and it wasn't until August that it really became competitive when the team received a sufficient number of BMW engines.

Dave Wass and his team began concentrating their efforts towards the future A8 as early as August. A more substantial budget was obtained, numerous wind tunnel tests were run in London and the entire chassis was built using carbon fibre, making it both lighter and more rigid. Unlike its predecessor the A8 quickly weighed in at the minimum authorised limit of 540 kilos. There's no denying that this is an up to date F1




*Looking down onto the Arrows A8. Note the placing of the long radiators in fan-like position following the trend in F1. Nothing unusual about the double wishbones with their push rods and mini rocker. The ergonomics of the cockpit have been carefully designed.*



*The bulky air/air intercooler and the enormous turbo.*

racing car — the second generation of the turbo era. The wheelbase has been lengthened to approach the dimensions of last season's championship winning McLaren and the aerodynamics have obviously been carefully improved on. Double wishbone suspension with push-rods has been mounted to both the front and rear and has been modified to suit radial Goodyears. The BMW accessories have also been carefully placed alongside the car, in front of the rear wheels. The large KKK turbo is placed to the left and the Bosch Motronic black box to the right.

## GOOD HANDLING

Tension was high along pit lane at 10:15 on February 18th as the Arrows A8 thundered out for its first lap on the rain-soaked track. Everyone was anxious as Boutsen came back to share his impressions. All ears were listening attentively, *"Well, the car definitely handles much better in fast curves than the A7. Braking has also improved as it is that much lighter. I can't really say much else because of the wet driving conditions except that I feel confident in this new car and that I enjoy driving it."*

Porsche had reserved the full 5.8km/-3.6-mile Ricard circuit for private testing and had agreed to sharing it with Arrows. The Stuttgart constructor had come with two 962s (an IMSA version fitted with the 2.8-litre single turbo engine and a Group C 3-litre twin turbo engine), together with a 956 featuring a semi-automatic gearbox seen last year. Jacky Ickx, Derek Bell and Hans Stuck had all reported for duty.

Tall Hans strode over to the Arrows gang to see how they were getting on and have a word with his BMW Motorsport friends. *"Congratulations,"* he said to Thierry, *"for your Endurance contract with Walter Brun. We're going to have a hard time contending with a team like you and Belloff!"* Later, during the afternoon, the large 'Piquet-model' turbo was fitted to the Arrows A8. Boutsen went out on wets again and after only a handful of laps on the water-logged track, he put in a time of 1m 58.6s. He came back full of praise for his new 'rocket'. *"I can't believe how much of a difference it makes having this turbo instead of the other one,"* he exclaimed. *"This morning I was at 9600 rpm down the straight and now, with exactly the same ratios, I'm at 10400 — a good 25 kph faster! It's as though I were using qualifying boost."* The BMW engineer Schumann admitted that with this turbo, which Arrows never received in 1984, Piquet had more power during the actual races than Arrows had during qualifying, ie, about 800 bhp. *"We had a good 100 bhp less than the Brabham,"* Boutsen said turning to Dave Wass. *"It's not surprising that we had trouble putting in good performances last season, is it?"*

Clutch problems resulting from a machining defect in the new gearbox and an unsuitably repositioned exhaust system (the twisting pipes exit under the car in the air extractors, to increase ground effect) meant that the Arrows team had to give up the idea of exhaustive tests on the chassis. It was still murky the next day so the carbon fibre brake tests were postponed until the following week at Donington. Arrows will be going over for the preliminary Brazilian GP tests at Jacarepagua during March and will thus be able to measure their worth against the other teams. The team will also reveal if the young Austrian Gerhard Berger will be taken on definitely as the second driver. ■

### TECHNICAL CHARACTERISTICS

**Chassis:** Carbon and kevlar.
**Suspension:** Front and rear — double wishbones, push rods and rockers.
**Gearbox:** 6-speed Arrows/Hewland.
**Tyres:** Goodyear.
**Weight:** 540 kilos.
**Wheelbase:** 2.75m.
**Front track:** 1.80m.
**Rear track:** 1.65m.
**Length:** 4.60m.
**Drivers:** Thierry Boutsen, Gerhard Berger (unconfirmed at time of going to press).





# FERRARI BACK IN BUSINESS

**THERE ARE THOSE THAT SAY PRE-SEASON FORMULA ONE TESTING PROVES VERY LITTLE WHEN IT COMES TO PREDICTING WHICH TEAMS ARE GOING TO BE ON TOP WHEN THE SEASON'S 16 RACES GET UNDERWAY. IF LAST YEAR'S DISASTROUS TEST FOR THE McLAREN TEAM IN RIO IS ANYTHING TO GO BY, WHICH THEY FOLLOWED UP WITH THE MOST SUCCESSFUL SEASON EVER IN THE HISTORY OF GRAND PRIX RACING, THEN THE LAST SEVEN DAYS OF TYRE TESTING AT THE RIO AUTODROME WILL BEAR LITTLE RELATION TO WHAT WE SEE WHEN THE 1985 SEASON OPENS AT THE SAME TRACK NEXT APRIL 7TH.**

*by Jeff Hutchinson*

Maybe, or maybe not, for although only eight teams took part in the test and there were only five of those teams with radically changed cars, the signs were there that we are in for a much more competitive season than we had last year with some old and new teams and faces ready to upset the order of 84.

The biggest change of all this season is, of course, on the tyre front, the Rio test being the first time that the latest Goodyear and Pirelli rubber have met head to head on the same track. Now that Michelin have gone from F1 several teams have lost what was a tyre advantage last year, while the remaining Goodyear/Pirelli tyre war seems to be loaded in Goodyear's favour with the greater number of teams and, as far as qualifying tyres are concerned, a more competitive tyre than Pirelli if the results of the Rio test are anything to go by.

Goodyear's domination of the tyre field this season has certainly not seen them ease off on tyre development. They arrived in Rio with some 1,700 tyres with around 50 new constructions to try including a new three-quarter inch wider front tyre which seems to be a big improvement over their previous tyres. Pirelli brought some 700 tyres to Rio in four different compounds based on the latest development carried out with Brabham during testing at Kyalami over the winter which saw Brabham run the equivalent of 42 Grands Prix. Pirelli also shipped in some new qualifying rubber towards the end of the test, but did not get much chance to run it.

## FERRARIS OLD AND NEW

The Ferrari team brought two cars to the test, the basic 1984 C4 model and the very much modified 1985 interim car. Behind the driver the new car seen in Rio

is completely altered compared to the C4. It is lower thanks to a revised engine layout with the turbos and exhaust systems mounted on either side of the engine under the V instead of on top of the engine between the V. It has an all new gearbox, a rear wing mounted by the side plates to a horizontal tube instead of a central vertical pillar for a cleaner air-flow. The oil tank is incorporated in the bell housing with the rear springs mounted ahead of the gearbox and two air intakes sticking up from the top of the side pods force air into the turbos. For the first few days the team spent a lot of time sorting the Weber electronic engine management system and trying to improve the cooling system for the hot 35 degrees C plus temperatures, while they also tried different aerodynamic set-ups and springs in order to get the chassis well-balanced. By the end of the week, Alboreto was running as fast as the rest of the teams on race rubber and on the final day, after electrical problems had spoiled his chances the previous day, Michele ran a series of qualifying tyre runs without additional boost pressure to set a best time in the heat of the morning of 1m 28.18s which was to remain the fastest time of the week, only eight-tenths of a second off Elio de Angelis' 1984 pole winning time despite the reduction in wing area on this year's cars.

Arnoux spent most of his time in the old car running tyre tests and cross checking information from the other chassis, but after Michele had finished running on Thursday afternoon, Arnoux took the new car for his first run of the week on qualifiers with, by then, tired turbos, which were getting a lot of wear from dirt picked up around the track, and set a best time of 1m 33.23s, fifth best of the day and eighth overall time of the week. If he was happy with his week's testing, he didn't show it.

## A TROUBLED WEEK FOR McLAREN

Just like last year's Rio test, the McLaren team had a troubled time. The car spent a lot of time in the pits while the Porsche engineers tried to get their latest fuel management system dialled in to work consistently throughout the power range, while Lauda, who started off the first two days of the test had a difficult time in getting the car balanced for the Rio circuit, a job not made any easier by the variations in engine performance. He lost more time in the pits with cracked intercoolers which had to be repaired while on Tuesday, after Alain Prost had tested on Sunday, his hopes of a decent day's testing were thwarted when the fresh engine fitted overnight went on to 5 cylinders because of valve trouble after just nine laps. He had set a 1m 36.4s by that stage which was to be his last and best time in the car.

Prost took over for the final two days, Niki hoping to get a run again on the last day, but an oil cooler leak and then a broken turbo saw Prost finish out the

*Test work was carried out with the RE50 chassis for the RE60.*

*An original piece of work. Two carbon discs on the Williams' front wheel!*

*The revised Ferrari V6. The turbos have been repositioned on either side of the engine.*

*Brundle and Bellof are going turbo for 1985.*

*Rosberg's holiday had obviously done him the world of good.*

*Stunning and fast despite teething troubles.*

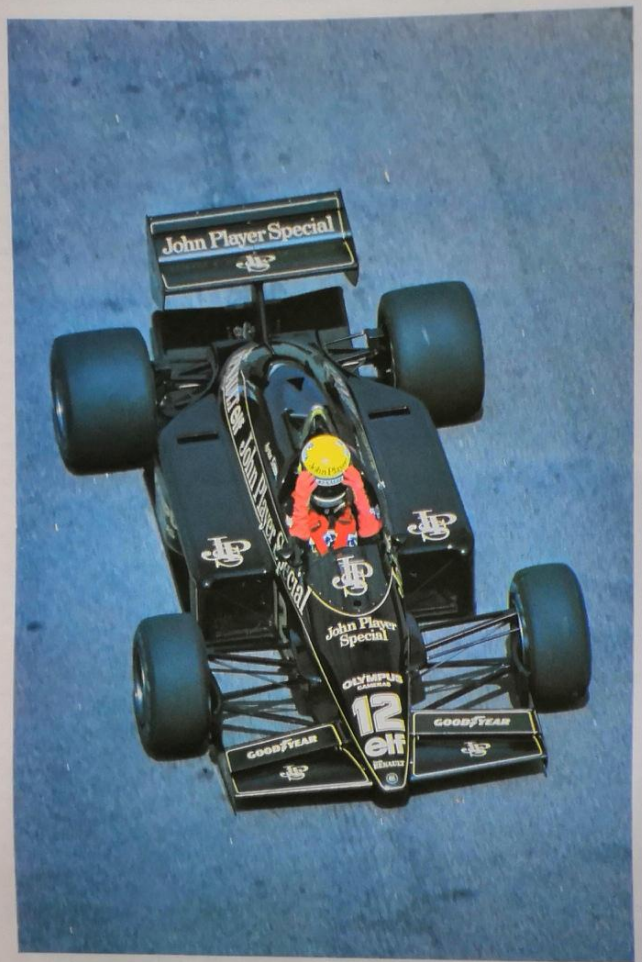
day's testing, McLaren not getting the time to run all the different race tyres that they would have liked. Right at the end of the test Prost tried the new qualifying tyres for the first time and joined Alboreto under 1m 30.0s with a best lap of 1m 29.89s, although as Prost said, *"It is much more important to do race tyre testing and chassis sorting than to make a quick time, but we have not been able to,"* although the previous day Prost had set an impressive 1m 33.89s on race rubber which was as fast as Ferrari had gone on race tyres.

## RENAULT PREPARE THE GROUND

It was an equally long week for the two Renault drivers as Derek Warwick and Patrick Tambay lapped their old RE50 chassis relentlessly carrying out considerable test work which they can put to good use in the new RE60 chassis. They ran lots of engine test work as well as aerodynamic and suspension changes in a bid to find improvements in handling and straight line speed. On Wednesday, Tambay finally got to run a set of qualifying tyres and extra boost when, to the amazement of the adjacent Honda mechanics next door, the Renault mechanics removed the turbo wastegate and blanked off the outlet. Tambay ran a best of 1m 31.3s despite finding Johansson in his way on his best run, the time good enough to put him fourth fastest overall. Derek Warwick didn't get a run on qualifying tyres and ended up a distant tenth quickest. Renault's new competitions director Jean Toth visited the team for two days during the test, but unlike his predecessor Gérard Larrousse was taking no active role in the actual running of the team which appeared to lack direction more than ever before. All the ingredients of success seem to be there, but without the knowledge and skill of a master 'chef' the team could be heading for another bad case of indigestion.

## ROSBERG - BACK WITH A BANG

It had been four months since Keke Rosberg had last driven his Williams Honda FW09 and although he was hoping that Estoril would be the last time in that car (*"Frank promised me then"*), he was nevertheless eager to give it a run when he arrived for the start of testing on Friday afternoon. Within three laps Rosberg was back in the groove, *"Like I had driven the car only yesterday,"* said a grinning Rosberg who immediately set a time in the 1m 36.0s bracket which, at the time, was the fastest of the day. He ended up with a 1m 36.0s dead, which was the second fastest time of the day. The novelty soon began to fade, however, when he began lapping 80 to 100 laps a day working through a long list of Goodyear test rubber as well as a lot of development ideas for the new Williams-




***New Lotus team member Ayrton Senna proved he was fast and the engine's potential.***

Honda which should be ready by mid-March. He briefly ran new experimental AP carbon fibre brakes with double floating discs on each brake at the front while he also spent much of the week on development gas regulated-Indy-style shock absorbers with a separate bottle which at a later date could be modified for driver-adjustable bump as in Indy racing. It could be a big help in improving handling as the car changes from full to light tanks in a race.

The next day, after Alboreto replied with his fastest lap to take the fastest time using the best combination of the three different front and rear qualifiers which Rosberg had used, Rosberg hoped to reply with an even faster time, but his plans were thwarted when he broke his second turbo of the day shortly after the start of the final afternoon session, *"It was a shame because I am sure that with the best of the qualifiers I had run the previous day and a bit of extra boost I could have broken last year's pole with no trouble,"* said Keke. *"Now I will have to wait until April with the new FW10,"* he added with a smile.

Nigel Mansell spent a long hard week running engine tests for the small army of nine Japanese engine men present with the team. He too, had a couple of turbos blow up and a clutch fall apart in the process, his long runs interspersed with long waits and it was not until Thursday afternoon that he finally got his chance for a quick run on empty tanks and qualifying rubber.

He set a 1m 32.4s despite running low on fuel on one run which caused the engine to hesitate in the last couple of corners, while his final run had to be suddenly aborted at the start of the flying lap when his car jumped out of gear over the bumps. He cruised slowly around for the rest of the lap to save his tyres and then went for another lap making sure to hold the gear lever in place this time. At the half-way point around the track he looked to be on a very fast lap, but before he had finished the lap his car started to misfire badly as it drank the last of its fuel which had been further depleted by the extra lap and a frustrated Mansell had to settle for what was to be sixth fastest time of the week.

## RAM, WILTING FROM THE HEAT

Although everyone was very impressed with Gustav Brunner's new neat little RAM Hart 03 chassis there was considerable doubt from the opposition and even engine supplier Brian Hart that the cooling system would be able to cope with the heat. The team's first problem was not the heat however, but the fuel system. For almost two days the team searched in vain for a lack of fuel pressure which was eventually traced to a faulty fuel filter installation in the fuel pumps.

With that sorted out, the car was ready to run late Saturday afternoon but after a couple of laps Winkelhock was back in the pits with the temperatures soaring on the water and oil gauges. A second oil cooler was fitted and then ventilation ducts cut in the rear body panel, but even then the temperatures were too high and the engine was damaged. With a fresh engine installed the temperatures were reduced still further by running the car without an engine cover, but the temperatures were still critical and the engine had to be limited to less than race boost.

Winkelhock set an impressive 1m 36.49s after very little running and then Philippe Alliot got to try the car for the first time on Thursday. Within 5 laps he set a best lap of 1m 38.24s, almost as fast as he had gone after several days of trying with qualifying tyres and boost for last year's Grand Prix.

With no way to cool the engine any more than they had already, John MacDonald decided to end the test a day early rather than risk another engine failure. Brunner is going to have to work hard to design another water cooling system around his attractive little chassis before the team can run again. Despite all the problems, Winkelhock was as impressed with the new car and the team as Alliot.

## BRABHAM — SURPRISED BY THE HEAT

While the RAM team finally wilted from the heat, the Brabham BMW team did manage to keep going thanks to a water sprinkling system!

Despite their thousands of miles testing in South Africa, the Brabham team were surprised when they found their car overheating badly. *"The temperature is not much different, but the heat coming off the track is much higher than in South Africa,"* said team manager Mike Blasche.

After attempts at adding spoilers and air dams to the front wings to push more air through the side pods failed, the team fitted a water container to the side of the side pod and pumped water on to the intercooler which allowed Nelson to run single fast qualifying laps with regular boost rather than the reduced race boost he had been forced to run before. He took what was to be ninth fastest time on one run, while further runs were spoiled by a crown wheel and pinion failure which was repaired, only to have a turbo blow up and catch fire.

The team had lost almost another day while the chassis was prepared following its long haul staight from South Africa testing. When Nelson finally got to drive it, he found the car still understeering badly as it had done in South Africa.

The car was also failing to respond to chassis adjustments the way it should. A closer inspection finally revealed a hairline crack in the rear bulkhead engine support frame, so a new chassis had to be flown out overnight and built up into a race car which cost the team almost another full day's running. All this meant that François Hesnault, who had been invited to Rio to test the car as a strong candidate for the second seat never even got to drive before the official end of the testing, although Brabham negotiated another half day's running on Friday in a bid to give him some time in the car.

## ENGINE PROBLEMS FOR LOTUS

Although outwardly very similar to last year's car but for the side-vented radiator cooling, the new Lotus 97T which arrived in Rio was a totally new car. A new stiffer, stronger monocoque developed from the Indy Lotus 96 chassis with aluminium honeycomb instead of nomex honeycomb between the carbon fibre and kevlar outer panels, a new front and rear suspension geometry and revised aerodynamics. A bigger cooling system in preparation for the new Renault engine with longer stroke and smaller bore has also been installed, although in Rio the Lotus team's main task was engine development on the latest 1984 interim engine which features nearly all new parts except for the block, heads and pistons. Right from the start of practice the development engine suffered from a bad pick-up problem with no power below 9500 rpm and after almost a week's testing and three different engines, the trouble was still as bad. Despite that, Ayrton Senna demonstrated the car's potential with a quick time on Saturday which was to stay the fastest time of the week until Rosberg shattered his time on Wednesday.

Senna might have shattered his own time, but just as he was about to try a run on qualifying tyres on his last day in the car on Monday, he ran into the back of Mansell's Williams Honda as they both went into the tight right-hander before the pits. Mansell wasn't making it easy for his new Lotus replacement to get by, while Senna should not have been so impatient to make his point — that he was faster. The result was a silly accident which saw Senna jump the Williams' right rear wheel which broke the right rear corner of his car and the left front suspension, nose and footbox of the Lotus. *"The first thing I knew about the accident was being hit up the back as I turned into the corner,"* said Mansell, while Senna accused him of holding him up and then cutting across in front of him as he turned into the corner.

*"All I can say is it was my rear wheel and Senna's front wheel which caused the accident. Judge for yourself who is to blame,"* added Mansell. The two had had a similar battle earlier that same morning. They both should have taken more care, more so Senna. The team lost a day and a half of testing while spare suspension was made up and flown out to Brazil, which did not amuse Elio de Angelis too much ending up with only one day's testing.

The drama in the Lotus camp and the number two treatment of de Angelis brought joy to their opposition who are no doubt hoping it will continue throughout the year!

## TYRRELL, STILL FIGHTING

Even though Tyrrell's own drivers are beginning to feel like David trying to conquer Goliath with their Cosworth powered Tyrrell chassis, the team is still working flat out on getting the most from what they have got and what they might get. Stefan Bellof and Martin Brundle were kept busy trying new wider suspension, exhaust systems and wing assemblies in preparation for their new car. Although the wider suspension meant much slower straight line speeds, the lap times were just about the same, *"Which shows it must be a big improvement. The car felt better over the bumps and was obviously cornering better because I lost 500 revs down the straight,"* said Brundle.

The car was put back to narrow rear suspension for a run on qualifying tyres, Bellof setting a best of 1m 37.79s, while Brundle set an even more impressive 1m 35.57s on the same tyres and configuration to take the 12th quickest time of the week.

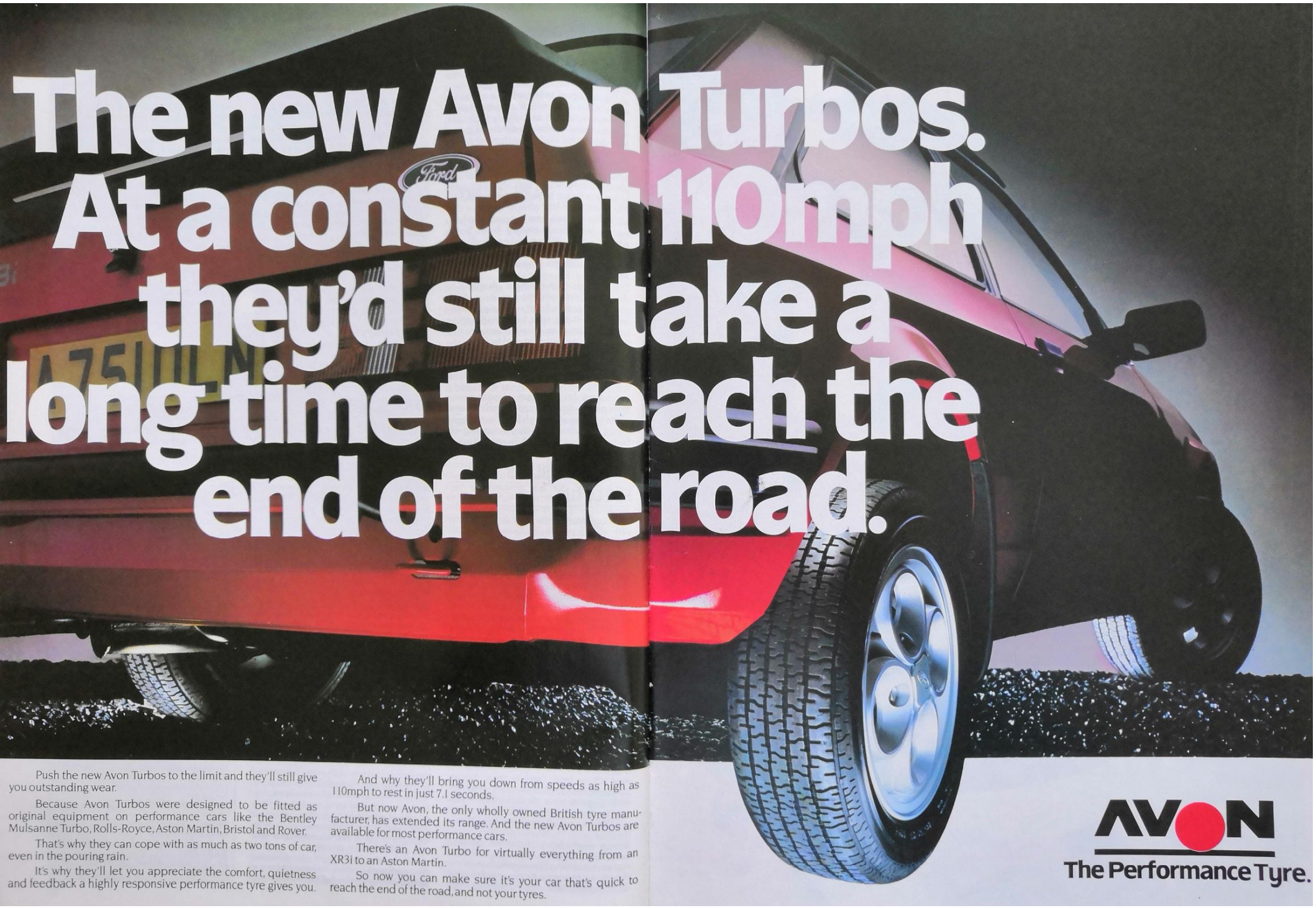
Seventh fastest time of the week and ironically the quickest of the three Pirelli runners in Rio was the new Toleman TG185 driven by Stefan Johansson. For the first four days of the test Johansson spent most of his time being towed back to the pits on the end of a tow rope, the new car plagued by a variety of little electrical and fuel injection problems which kept Brian Hart working overtime trying to unravel. No sooner did he find one problem than another one took its place. Eventually he got them all ironed out, a second battery helping to cure a persistent misfire as the car's electronic fuel management system struggled in the heat. That was just a small part of the team's problems however, for they arrived in Rio with just old Pirelli tyres to last them the week. *"Whatever tyres we had, we had to come to the test to make sure the car's cooling systems would work in this kind of heat,"* said designer Rory Byrne. A few extra ventilation slots appeared in the bodywork before the end of the week, but on the whole the temperature was no real problem, Byrne having designed the new car around his usual expansive radiators.

Fortunately for Toleman, Enzo Ferrari intervened in their predicament and persuaded Pirelli boss Sig Sierra to supply the team with a few more sets of tyres to get them through the week. One of those sets was a rejuvenated set of soft race cast-offs from Brabham and with those tyres Johansson set an impressive 1m 32.6s having been consistently amongst the top few runners until the rest of the teams started bolting on qualifying rubber. On Thursday, Toleman had no more soft tyres to try and run any faster, so they took what they had left and went full tank testing, Johansson setting an equally impressive 1m 38.8s before a broken turbo spoiled his run.

Although Pirelli have still not agreed to supply Toleman with tyres for the season, because of a lack of production capacity they say, the Toleman's showing in Rio, thanks to the talented Johansson and the much-improved new chassis from Byrne, certainly warrants assistance from either Goodyear or Pirelli. It would be a shame to see such a good driver, car and well-run team drop out of the championship. For Pirelli as well.

### Overall testing times, Rio 8th-14th February, 1985

1. **Michele Alboreto** (Ferrari 126/C4) development car, 1m 29.18s.
2. **Alain Prost** (McLaren TAG Porsche MP4/2) 1m 29.89s.
3. **Keke Rosberg** (Williams Honda FW09B) 1m 30.6s.
4. **Patrick Tambay** (Renault Elf RE50) 1m 31.3s.
5. **Elio de Angelis** (Lotus Renault 97T) 1m 31.62s.
6. **Nigel Mansell** (Williams Honda FW08B) 1m 32.14s.
7. **Stefan Johansson** (Toleman Hart TG185) 1m 32.6s.
8. **Nelson Piquet** (Brabham BMW BT53P) 1m 33.31s.
9. **René Arnoux** (Ferrari 126/C4 development car) 1m 33.23s.
10. **Ayrton Senna** (Lotus Renault 97T) 1m 33.34s.
11. **Derek Warwick** (Renault Elf RE50) 1m 34.79s.
12. **Martin Brundle** (Tyrrell Ford DFY 012) 1m 35.57s.
13. **Manfred Winkelhock** (RAM-Hart 03) 1m 36.14s.
14. **Niki Lauda** (McLaren TAG Porsche MP4/2) 1m 36.49s.
15. **Stefan Bellof** (Tyrrell Ford DFY 012) 1m 37.79s.
16. **Philippe Alliot** (Ram Hart 03) 1m 38.24s.

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# BUCK UP PLEASE!

THE STATE-OWNED RÉGIE COMPANY JUST MISSED THE TITLE IN 1983 AND LAST SEASON WAS PARTICULARLY BLEAK. THE INGREDIENTS FOR SUCCESS WERE ALL THERE AND THE RE50 HAS PROVED ITS WORTH ON SEVERAL OCCASIONS. A DOZEN LAPS MAY NOT BE MANY, BUT ENOUGH FOR A NOVICE TO DRAW SOME INTERESTING CONCLUSIONS

*by Jean-Pierre Malcher*

What does a Formula One racing car conjure up in your mind? Would it be possible to compare it to a bomb with its inconceivable accelerations and confoundingly powerful brakes? Do you have to train regularly to be fit enough to fight against the centrifugal force, a direct result of the awe-inspiring road handling?

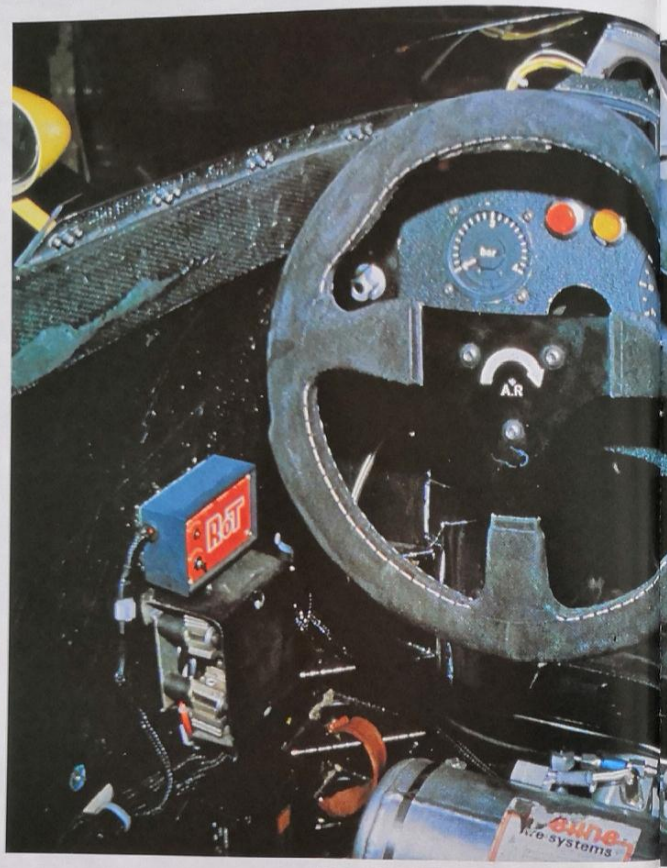
Or is it just another car — a very powerful one, granted, but which is nevertheless destined for lesser mortals such as yourself and thus open to criticisms and comparisons?

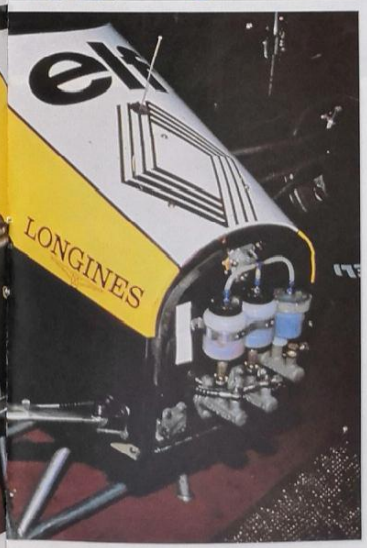
Before I found myself behind the wheel of the RE50, I was rather in favour of the first theory. And now, that much richer in experience, I feel compelled to admit that a F1 is in fact just another car. I'm sorry if I've shattered your dreams and brought you down to reality with a bump but let me assure you, it's honestly easier to drive a top F1 car than a second-rate Formula Renault. Please don't count on me to keep the myth alive. Driving a F1 is a matter of fact business.

## BEGINNERS AND ENLIGHTENED AMATEURS!

Having said all that, I had no qualms accepting the Régie's invitation to track-test their RE50. I had never driven a F1 before. It's almost an unheard of experience to drive a 'top level' F1 and only a handful of journalists had been invited this time. The complete novices amongst us were only allowed a ride on the Castellet aerodrome, where they had time to accelerate, brake, about turn and ditto, whilst those already familiar with the techniques of driving a single seater were let out on the shorter 2.06-mile Ricard circuit. It goes without saying that now that our debutant colleagues have had a real taste of what it feels like to drive a really powerful car, they won't be needing dictionaries to describe their impressions and emotions!

Strong gusts of wind were blowing and the sky was dark. It looked as though it would rain any minute and as usual, in this kind of situation, time was already running short. The morning had been spent on the runway and was followed by lunch with the whole of the Renault contingent on their premises along the Mistral straight between the Méjannes Ess bends and Signes. They have their own direct access lane onto the track and a sophisticated timing system — Renault have improvised their own






***The rev counter to the right behind the steering wheel and to the left, the boost pressure gauge graduated to four bars.***

***The RE50 chassis inspires confidence. Classical wishbone suspension. The spring/damper combination is linked to the wheel hub by means of an oblique tierod.***





'Maranello' !

I must admit that it felt rather peculiar being there. The mechanics made us feel we were tourists and, although Patrick Tambay and Derek Warwick were extremely helpful and co-operative, they were obviously wrapped up in thoughts concerning their test-runs. The on-coming season is all that's on their minds and they couldn't have looked more optimistic if they'd tried. I wonder if there wasn't another reason to their high spirits.

Gérard Toth did not appear very relaxed. Is it possible to be a sports director with practically no track experience? We'll know the answer to that question at the end of the season. Whilst some were still finishing off their lunch, others were making sure everything was set up correctly, tightening and untigthening screws and then retightening them again — a familiar sight on any circuit. I didn't know what to do with myself and paced around nervously. I was feeling on edge because I was sure it was going to rain and I felt we were wasting time lingering over the meal.

The circuit wasn't due to open until 1:30 pm anyway so to give myself something to do, I donned my racing overalls and slid into the cockpit. There wasn't much adjusting needed as the smaller of the two seats destined for tiny tots like myself was still on the car from the morning's aerodrome stint. The seat was odd in that it also contained the water tank for the engine injection system. It was just as well I fit snugly because it takes over an hour to change. I took it for a good omen that no extra bits of foam were needed to get me sitting comfy. The first thing that hit me as I sat there in front of the steering wheel was the incredible amount of play as I turned it. As you are undoubtedly aware, a F1 steering wheel can be removed in a split second, you just pull the pin out of the splined shaft, and the lower the gearing, the more play there is. The second thing was that it actually felt quite cozy sitting in there. Cozy isn't exactly the right qualifier, I know, but I've tried other single seaters and I've rarely been able to wriggle my way in with so little discomfort. The only other thing I could do, apart from turn the steering wheel like an overgrown school boy, was contemplate the instrument panel staring at me. The boost pressure dial is now a highly rated object and is barely smaller than the rev counter on the Renault dashboard. Since driver-adjustable boost pressure has become the trend, it is of vital importance that the parameters be strictly respected (2.2 bars for boost pressure which corresponds to 3.2 bars of atmospheric pressure) and as precisely as possible. Another 'in' dial on F1 cars, (which first made its appearance on production models in 1976) is the econometer. In fact it is a mini on-board computer which informs the driver exactly how much fuel is being burned and how much is left. That's how Patrick Tambay knew in advance he wouldn't be able to hold on to his second place until the

### A lap in the RE50

The shorter 2.06-mile Paul Ricard Circuit is one of the safest in the world as well as being highly technical. It therefore constitutes the ideal testing ground for a F1 race car. So, allow me to take you round in the RE50.

At the end of Pits Straight you are drawn into the Mejanes Ess bends. There's not much run-off area at this particular point (which is not used for GPs) and I wasn't going to risk any hard braking in view of the little practice I'd put in. Whatever line you choose for the first right-hander, you're still braking as you turn in but the Ess itself is relatively easy to negotiate. Exiting out of the second right-hander and onto the Mistral straight is no problem despite the camber and the huge surge of power as you hit the throttle hard.

approaching the Signes curve which follows the straight is quite something when you realise that the F1 boys keep their feet down to the floor board all the way. I couldn't on my first flying flap! After ten laps I managed it but with maximum downforce created by the rear wing, I managed a respectable 150 mph against their 169 mph. I think I would need at least a full two days practice before trying at that speed.

After this ordeal, it's onto the double Beausset right-hander. The entry is tricky and you have to brake hard going into the curve. There are no useful land marks to guide you. I couldn't help braking too early and too hard. However, once you hit the apex, it's fairly plain sailing as you accelerate hard until you let your foot up for a fraction of a second to line the car up for the second tighter part of the Beausset. Then you can open up on the throttle well before you hit the apex. Before you've time to take in your breath you're in the Pif Paf. With a fair amount of experience behind me on the Ricard, I usually drop down to second slap bang in the middle — in true GP fashion. But with only a few miles at the wheel of the RE50 I deemed it a wise precaution to change down before.

A short burst of power and you enter the left hairpin. You have to brake slightly as you go in, but it's all too easy to find yourself out of control if you haven't put enough pressure on the brake pedal. I won't be forgetting that power slide at the entrance on my first lap in a hurry!

The long right curve that follows doesn't present any particular problems and leads you into the left-hander called the tower. I found it relatively easy to brake late and sharply with the F1 Renault. Probably because I know from experience that even if you leave the braking until it's really too late, there's enough room for error.

Gear change down to second and into the Tower right-hander' where you have to get the power onto the wheels as early as possible for a good clean exit. I found that the RE50 had a great tendency to understeer at this particular point which I was unable to compensate for. Maybe I should have gone further into the turn on the brakes.

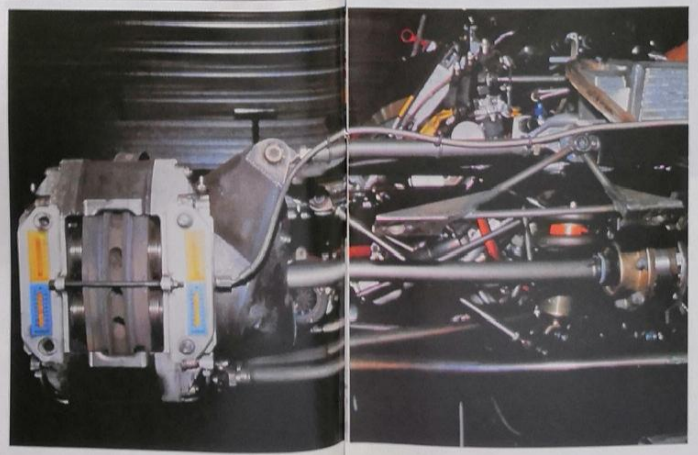
Anyway, that brings you back down Pits Straight once again, and so ends a lap on the short Ricard circuit.

finish of the Brazilian GP last year (he coasted home in 6th), and that despite putting in the fastest race lap during the South African round, he was going to be left high and dry somewhere out on the circuit.

Apart from these up-to-date instruments there are of course all the classical knobs and levers for the brake balance, anti-roll bar stiffness and so on. The age of brake electronics hasn't dawned but I don't think it will be much longer now. A F1 race car's brakes, like any production cars', despite sophisticated carbon discs, ceramic pistons and the rest, still have a lot of scope for development. Patrick Tambay had to watch Lauda sail past because of his rear wheels locking during hard braking at the French GP. Derek Warwick wanted both to have his cake and eat it — remember at Dallas how he tried to outbrake Mansell. His rear wheels locked letting out clouds of black smoke and he lost control of the car as it careered off sideways. There remains a great deal of development work to be carried out on the brakes, not only to avoid the aforementioned hazards but to enable later braking in curves as the driver cannot take advantage of the grip on the outside tyres without the front inside wheel locking up.

Back to the subject now. The quality and finish of these synthetic beasts never fail to astound me. I must admit that not all F1s fall into the same category — results have nothing to do with it — but the Renault is less of a *chef d'œuvre* than the McLaren. But, all the same... The carbon honeycomb sandwich tub is well worth pondering over, together with the slimness of the wishbones and the clear cut, rigid, light carbon fibre rear wing. All the fruit of modern science is there, ie, the logical evolution towards ever lighter, more compact and increasingly better-balanced racing cars. In the past engines were bulky and awkward-looking — nowadays, they are merely 4 or 6 (or sometimes 8) cylinder affairs. Some qualifying engines even boast 1,000 bhp for 1500cc!

The RE50's V6 turbo EF4 power plant produces between 650 and 750 bhp (about 650 for our track test car). Massive intercoolers and radiators now are familiar accessories on all F1 cars and go hand in hand with turbo technology. In my humble opinion it's a great shame that the equivalences for normally-aspirated engines were not worked out differently. I firmly believe that a 4-litre Cosworth engine would have been competitive for years to come.



***Ultra-powerful and resistant brakes with giant-size carbon discs and finned pistons. F1 brakes are incredibly powerful and progressive but there is still room for improvements in brake balance.***





## TWO LAPS TO START WITH...

What for? The RE50 I was sitting in is simply a large version of a Formula Renault. I was hardly likely to fly off especially with the amount of downforce that had been applied. Patrick Tambay had the car set up to his liking but full downforce was now applied for safety reasons, no doubt, and to slow and stabilise the car. I began my run down the Mistral straight tightly harnessed into the cockpit. I'd been told not to go over 10500 rpm and that the procedure, if I stalled, was to let out the clutch quickly whilst in gear and, secondly, to allow for the discs to get to the right working temperature before attempting any hard braking. The plan was to go out for two laps to see if all was OK, then five to begin pushing the engine followed by a full seven laps in which I could push myself!

In other words, I would be putting in a couple of warm up laps, get used to the feel of the car for five and then seven in which I could put in a time. I made sure that I got someone to take all the times. I wanted to know just how good (or bad) I really was, nothing to do with engine potential — the Renault drivers were there for that sort of thing. No, it was rather a case of taking advantage of the chance I was being offered to obtain other performance figures than the eternal 0-60 mph. When you come to think about it, it's rather ridiculous getting journalists to test a F1, after all the best person to do that — one would have thought — is the car's regular driver and the best testing ground is naturally under race conditions.

Anyway, so there I was on the very gentle slope leading out from the Renault premises onto the track, a touch of the air starter and into first gear.

I kept the clutch in for a few seconds and then let it out three times in quick succession. I was off! I had planned to warm the discs during these two laps and get the feel of the gearbox whilst giving the tyres time to reach the ideal

### Renault RE50 Technical Characteristics

#### ENGINE SPECIFICATIONS

**Type:** 1.5 litre Renault Gordini EF4 V6 90° turbocharged.
**Engine size:** 1492cc. Bore and stroke: 86 x 42.8 mm, 4 valves per cylinder. Swept volume per cylinder: 248.6cc.
**Compression ratio:** 7.5:1.
**Engine weight:** 160 kilos with starter, clutch and turbocharging system.

#### DIMENSIONS

**Length:** 680 mm, without clutch.
**Height:** 640 mm.
**Width:** 480 mm.
**Maximum revs:** 12000 rpm.
**Maximum torque:** 49 mkg at 8500 rpm.
**Maximum power:** 660 - 750 bhp depending on settings.

#### CONSTRUCTION

- **Engine block**
Made of aluminium by the state-owned Renault company's foundry. The general assembly is of the 'bearing' type.
The wet liners are made of aluminium.
- **Cylinder head gasket**
Composite metallic gaskets and Viton 'O' Rings for oil and water passages.
- **Crankshaft**
The crankshaft is turned from solid steel and nitrided. Four main bearings. The con rods are forged steel. The pistons are made from forged aluminium alloy.
- **Cylinder heads**
Cast aluminium alloy and include four valves per cylinder. Valve angle in respect to the cylinder axis is 10° for the inlet and 11.30° for the exhaust.
- **Timing gear system**
These are driven from the crankshaft by means of a relay of three gears, then by two toothed belts which drive the two camshafts of each cylinder head along with the accessories mounted on each side of the engine.
- **Water pump**
Two centrifugal type water pumps, each one supplying a row of cylinders.
- **Lubrification**
Dry sump type.
- **Injection system**
Indirect injection system — Kugelfischer plunger type pump driven by the right hand bank's inlet camshaft.
- **Ignition**
Magnetti Marelli electronic ignition alternator.
- **Turbocharger**
Twin KKK turbochargers. The waste gates are attached to the exhaust system (one per cylinder row).
- **Intercooling**
Two air to water intercoolers.
- **Water injection** (depending on configuration)
Two centrifugal water pumps, each one supplying one cylinder.

#### CHASSIS

**Constructor:** Renault Sport.
**Type:** RE50 01.
**Bodywork:** Kevlar, carbon, epoxy and honeycomb. Carbon fibre rear wings.
**Chassis:** Tub and cross members — composite materials: carbons, Kevlar, epoxy.

#### DIMENSIONS

**Wheelbase:** 2.680 m; **Front track:** 1.802 m; **Rear Track:** 1.670 m; **Weight:** 540 kilos; **Front wheels:** 13x11.5; **Rear wheels:** 13x16.5.
**Brakes:** Front and rear: Brembo calipers and discs; Ventilated front discs (276.5 x 28); Ventilated rear discs 276.5 x 25.4; Ferodo DS 11 pads; possibility of fitting carbon fibre SEP discs and pads according to circuit conditions.
**Suspension:** Front and rear — Double wishbone and pull rod.
**Steering:** Rack and pinion.
**Tank:** One flexible Superflexit FT3 tank; Capacity: 220 litres.
**Radiator:** Light alloy water and oil radiators.
**Gearbox:** 5-speed, Renault casing, Hewland pinions.
**Clutch:** Borg and Beck double dry plates.
**Transmission:** Renault-Glaenzer.
**Tyres:** Michelin: 23 x 62 x 13, 40 x 66 x 13.

temperature and in doing so I could get a feel of how much grip they were providing. I noticed that the gearbox made rather suspicious sounds as I'd shift down, probably from this morning's treatment on the runway! As agreed, I came in after the two introductory laps to report. OK. I was given the go-ahead. I'd already had time to notice the flexible nature of the engine and how easy it was to drive. Only a few days prior to my Renault track test I'd tried a Formula Renault whose road handling qualities had me feeling anxious as it veered off its line going into the fast turns. The point I'm trying to get home is how difficult it was trying to drive a novice's single seater and how much easier in comparison it was at the wheel of an awe-inspiring F1 car! I was amazed at the traction out of the turns and at the road handling qualities on the RE50. Make no mistake, the power was there alright, but that wasn't what impressed me most. I felt self-assured as I began attacking on my first full lap. I'd planned to allow myself plenty of room at certain braking areas. You can't rush your fences in this kind of situation and my first lap was timed at 1m 13.5s — nowhere near spectacular, I must admit. The first thing that I noticed was that the RE50 accelerated hard in second and third gears but the engine seemed to be lacking in power in fourth and even less in fifth as I blasted my way past the Renault building. Yes, the engine definitely didn't seem to be giving its all in fourth and fifth. Secondly, as I lifted my foot off the pedal going into Signes — which I reckon is normal on a first full lap! — I had the unpleasant impression that a parachute had suddenly opened out behind, like on dragsters! That was in fact the direct effect of having the rear wing set up especially for us journalists. It's true when you hear that journalists' cars are never identical to production models. OK, I'm not really serious, but I was more than a little startled as the car was jerked back, or so it seemed. Now that I was ready, I started pushing the engine. I began applying the power as soon as I hit the apex and sometimes just before. I couldn't believe the traction I was getting exiting out of the corners. I never felt the rear slide and I never had to apply opposite lock once. I had the impression that the rear tyres were glued to the track. Not pushing hard enough you say. And you're probably right, although in some turns I really felt I wasn't far off the limit. I finally managed to get the rear to slide a fraction in the Beausset double right-hander, one of my favourites, and the run off area is particularly roomy there. As there was a strong side wind blowing and too much downforce to the rear, I felt the car actually understeering. Another thing that impressed me was the accuracy of the steering which remained precise and responsive throughout. Full marks there.

I have two comments to make concerning the brakes, the first being that the pedal is rather spongey and the second, that they're noisy. But, despite that, no criticisms on their efficiency. Earlier I mentioned that there is still much development left to be done concerning the brakes but the hardest thing to make full use of, when you're a beginner like myself, is unquestionably the brakes. I found I was braking some 20, 30 or even 50 metres too early! The wheels didn't block up once, so you can see, I was a long way off the limit.

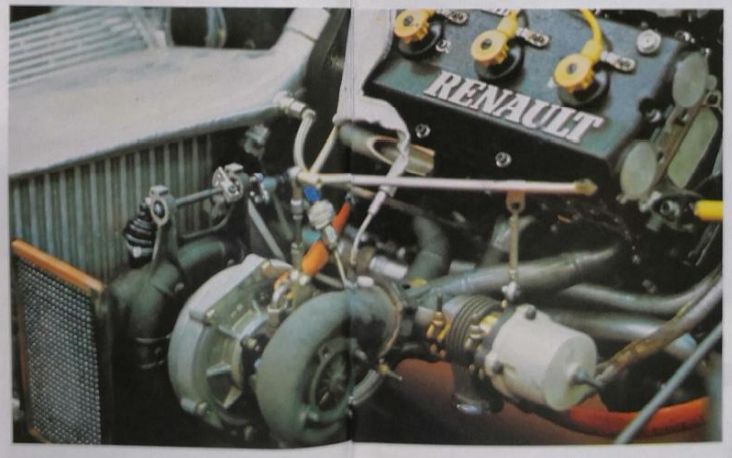
## A STARVING ENGINE!

After those five laps, of which I'd only been timed on three of them as you lose a lap going out and coming in, I drew up in front of the workshop again. Nothing to report except that I didn't find the engine as powerful as it should have been. The Régie mechanics looked at each other worriedly. They must have thought that I, the test journalist, was completely off my rocker! Who was I to say that their F1 engine was unresponsive in fourth or fifth!

Rather than make a complete fool of myself, I didn't insist and went out for my seven-lap ration, which was in fact cut down to five.

This time, I attacked hard. I almost went through Signes flat-in-fifth — the RE50 didn't budge the slightest millimetre off its line. I left the braking a little later at all the turns, but I was playing careful as I went into the Beausset and Méjannes. I exited early and unhesitatingly. In other words, I was trying to put in a time not too far off Tambay's or Warwick's. I was hoping to concede under three seconds to them which would have given me the satisfaction of feeling that I had come close to the truth of what it was really like to drive the RE50. Much to my disappointment, my best time turned out to be 1m 10.0s against 1m 05.0 for both Tambay and Warwick. To my way of thinking I didn't feel that I'd been let out in favourable conditions, the track was cold and I was on Michelin 05s left over from last year. Well, so that was that then. I was still adamant about the lack of power though. Through sheer obstinacy I found out from the time keeper that I'd only reached a top speed of 243 kph/151 mph down the Mistral straight whereas the usual speed is generally about 273 khp/170 mph! I was sure that I'd had my foot down to the floorboard and that I'd made a good exit out of Méjannes. My suspicions were not long in confirming themselves. Pierre-François Rousselot, an experienced F1 tester, was next out after me in the RE50. He echoed my impressions when he came in after two laps. It was back to the workshops for a close inspection of the turbos. One was being removed when a mechanic exclaimed, *"Look, here's why!"* The huge right intercooler was slit open like a tin of sardines. The turbos had been expelling the air back into the air.

Of my promised 650 bhp, I could only have had 500 bhp, if that. That, combined with maximum downforce from the rear wing meant that my drive in the RE50 wasn't something I'd remember until my dying day. I hope that I'll be given a second chance and I also hope everything will be in perfect working order when I do. ■




***The Renault V6 is compact, slim and contrasts sharply with the bulky nature of the turbos and intercoolers.***

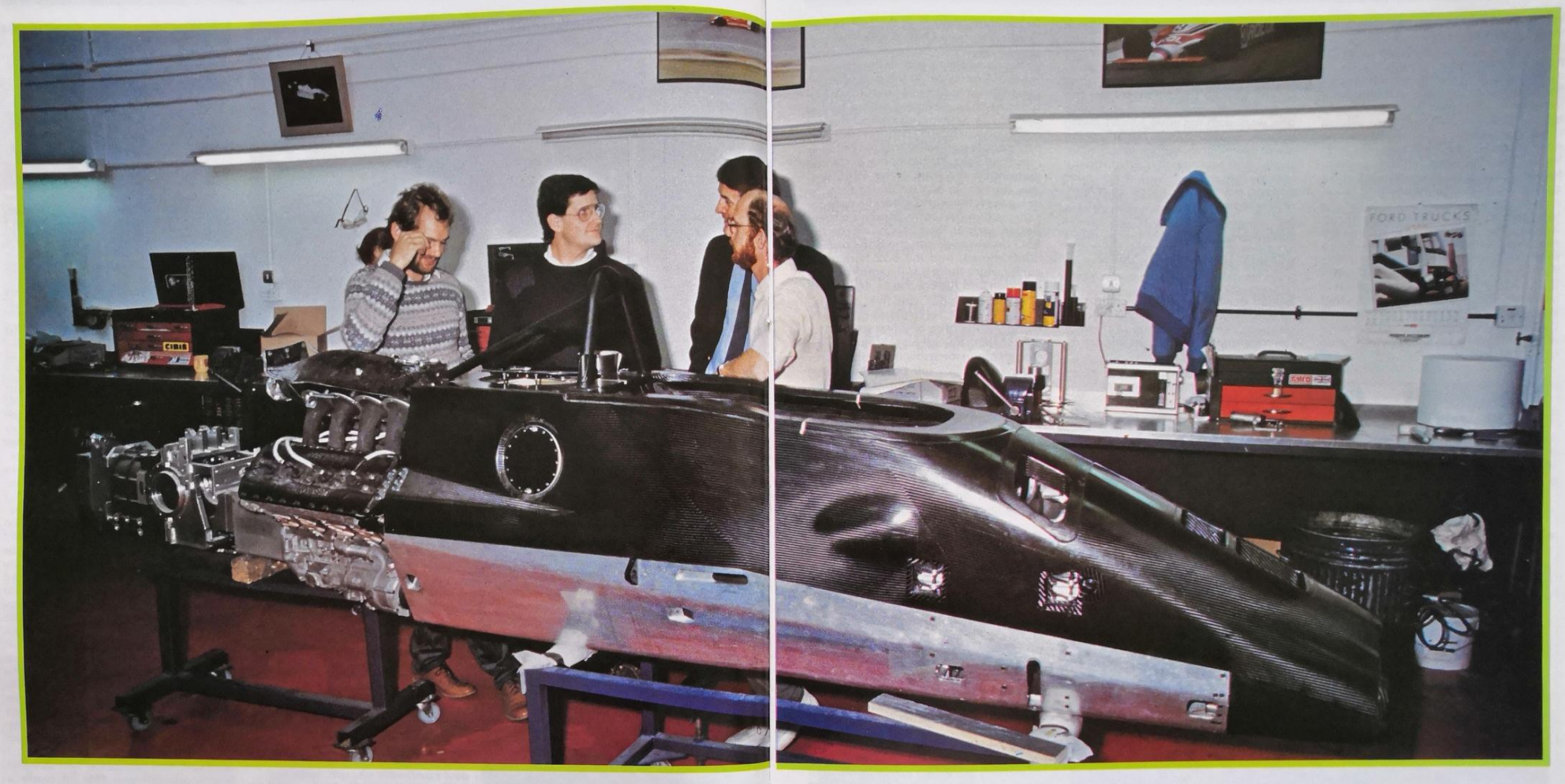
***Close-up of the turbo and the famous DPV which improves on flexibility at low revs and reduces throttle lag.***

### The RE50'S record

| Grand Prix | | Qualifying | Race | |
|---|---|---|---|---|
| BRAZIL | TAMBAY | 8th | 6th | Almost out of fuel, lost possible 2nd place. |
| | WARWICK | 3rd | DNF | Broken suspension following tangle with Lauda. |
| SOUTH AFRICA | TAMBAY | 4th | DNF | Race lap record. Ran out of fuel. |
| | WARWICK | 9th | 3rd | |
| BELGIUM | TAMBAY | 12th | 8th | No grip, inadequate brakes. |
| | WARWICK | 3rd | 2nd | |
| SAN MARINO | TAMBAY | 14th | DNF | Accident at start. |
| | WARWICK | 4th | 4th | |
| FRANCE | TAMBAY | Pole | 2nd | Race leader until lap 41. |
| | WARWICK | 7th | DNF | Tangled with Surer. |
| MONACO | TAMBAY | 6th | DNF | Tangled with Warwick. |
| | WARWICK | 5th | DNF | Tangled with Tamboy. |
| CANADA | TAMBAY | DNS | | Withdrew entry following Monaco Incident. |
| | WARWICK | 4th | DNF | Problems with tyres and fairing. |
| DETROIT | TAMBAY | 9th | DNF | Gearbox. |
| | WARWICK | 6th | DNF | Race lap record. Gearbox failure. |
| DALLAS | TAMBAY | 10th | DNF | |
| | WARWICK | 3rd | DNF | Went off whilst trying to get past race leader Mansell. |
| GERMANY | TAMBAY | 4th | 5th | |
| | WARWICK | 3rd | 3rd | |
| AUSTRIA | TAMBAY | 5th | DNF | Engine failure. |
| | WARWICK | 6th | DNF | Engine failure. |
| HOLLAND | TAMBAY | 5th | 6th | Held up by lengthy tyre change. |
| | WARWICK | 4th | DNF | Off. |
| ITALY | TAMBAY | 8th | DNF | Throttle. |
| | WARWICK | 12th | DNF | Engine failure. |
| EUROPE | TAMBAY | 3rd | 11th | Fuel feed went whilst holding on to 2nd place. |
| | WARWICK | 7th | 11th | In 4th position when exhaust went. |
| PORTUGAL | TAMBAY | 7th | 11th | |
| | WARWICK | 9th | 7th | |
| | STREIFF | 13th | DNF | Differential. |

DNF: Did not finish. DNS: Did not start

| | | |
|---|---|---|
| DRIVERS' WORLD CHAMPIONSHIP | Derek Warwick: | 7th (23 points) |
| | Patrick Tambay: | 11th (10 points) |
| CONSTRUCTORS' WORLD CHAMPIONSHIP | Renault : | 5th |




FORMULA ONE

# RULE BRITANNIA!

LAST YEAR ONLY 94% OF THE CARS THAT LINED UP ON THE GRID FOR THE INDY 500 WERE MADE IN ENGLAND; THIS YEAR MARCH ENGINEERING AND LOLA CARS HOPE TO HAVE 100% REPRESENTATION, DESPITE THE INTERVENTION OF LOTUS AND ROY WINKELMANN. EVEN THE PRESENCE OF LOTUS ON THE GRID, THOUGH, WOULD REPRESENT A CLEAN SWEEP FOR BRITISH MANUFACTURERS, AND IT IS CERTAIN THAT EVERY CAR WILL BE POWERED BY THE COSWORTH DFX TURBO ENGINE MADE IN NORTHAMPTON.

*by Michael Cotton*

Before the 1984 season had got under way March had sent 48 chassis to America, Lola 5. The fact sheet says that 29 starters at Indy were in March products as were all 13 finishers, yet at the end of the CART season Mario Andretti took the top honours for Carl Haas' Lola team. The result? By the time qualifying starts this year March will have sent 46 new chassis type 85C over via AMI Racing Inc, and Haas will have accounted for 20 Lolas... that's a total of 66 cars, enough to fill the Indy grid twice-over with up-to-the-minute chassis. The total value of this export, with engines, is a surprising $11,750,000, though the tyres and most of the drivers will be made in America!

Both Eric Broadley of Lola and March's Robin Herd believe that Britain has a clear lead in race car engineering and innovation which has been forced along by the pace of Formula 1 car development, and the continuing employment development. As an aside, Broadley is sure that his American importer, Carl Haas, will enter Grand Prix racing in 1985 but he, Broadley, will not design the car. *"There are two classes of racing car manufacturers,"* he says. *"The Formula 1 teams need a lot of specialists and work with far more people along accepted research lines. Then there are the commercial manufacturers like ourselves, and we know that when you are selling the product you don't have enough margin to pay for a lot of high-tech research."*

## BROADLEY - AN INTUITIVE DESIGNER

Behind the two names the contrast in style is clear. Broadley is an intuitive designer, an old sparring-partner of Colin Chapman, who knows instinctively how to make a successful racing car. Of the hundreds of designs he takes responsibility for there have been few failures; virtually all have been very good or outstanding, with good commercial prospects. He employs 55 people and will make 90 cars for the 1985 season, with America as his main market. Lola designs for 1985 include the T900 Champcar, the T598 SCCA Sports 2-litre, the C2 class T616, the T710 Chevrolet Corvette prototype for General Motors, the T810 Nissan-Lola designed for the Los Angeles importer, Electro Motive, the T740 Formula Ford and the T950 for the new F3000 category.

***Robin Herd seen chatting over a carbon tub.***

of one of France's leading designers, Gérard Ducarouge, at Lotus perhaps reinforces this view. In recent months *"The Duke"* has been busy developing the Indy Lotus which will make its debut in May, and since neither March nor Lola are actively involved in Grand Prix racing now it will be interesting to see if the Lotus has any significant advantages at speeds of over 200 mph.

Though March and Lola have been successful in Formula 1 neither has won a World Championship, held back by their basic need to make productionised racing cars for a living rather than throw themselves into the maelstrom of F1

Robin Herd, though, is the technocrat, graduating from Oxford with first-class degrees in physics and engineering and going on to play a part in the development of Concorde. At the age of 25 he joined Bruce McLaren's new Grand Prix team as chief designer, where he led the way in developing composites for monocoque chassis. He now employs 122 people and will in fact make fewer cars than Lola, 80 being the projected number for the start of the 1985 season, though he has no doubt that, by value, his is the world's leading race car construction company. March's current designs include the 85C Champcar, the 85G IMSA sports car, the 85B Formula 3000 chassis, and the 852 Formula 2 car for which there is still a small market in Japan and the Far East.

Both the March 85C and the Lola T900 will be superior to their predecessors, notably in the area of driver safety. The 85C, in fact, is a completely new design though along the same principles with a honeycomb alloy tub base (for impact strength) and kevlar/carbon fibre materials for the upper part of the chassis and bodywork. *"The 81C, our original Indy car, was developed over a three-year period to become the 84C, but it was beginning to show its age a bit,"* says Herd. *"The 85 C is stronger but lighter, stiffer, has better aerodynamics with more downforce and less drag, and a lower centre of gravity."*

## ROBIN HERD - THE TECHNOCRAT.

The 85G sports car is also a completely new design with a one-piece honeycomb dashboard bulkhead for increased rigidity, while the cockpit has been made larger and incorporates a driver cool-suit, along with improved ventilation. The suspension has been improved by adopting the 85C's axles, with AP's new lightweight brakes and lighter wheels too.

On the subject of driver safety Herd has some interesting views. *"I am very wary of making the whole car of kevlar and carbon fibre because of the way these materials shatter in a major accident. I would only use them for the entire construction if we could produce a safer car."*

In particular the footwell area has extra reinforcement, though *"for the driver to stand any chance of surviving a head-on 200 mph impact (325 Kph) with the wall the front structure would need to be more than four metres long, which is impossible."*

Instead the speedway drivers are now developing a new technique of steering down the banking and hitting the brakes once control has been lost. *"It may be the opposite of their reflex action, but it means that the car will go into a downward spin and if they hit the wall it will be a glancing blow, probably not too serious."*

March Engineering, at Bicester in Oxfordshire, has two design teams working





alongside each other on new concepts, one for aerodynamics and one for structures. The latter takes in design function and safety, and shortly after our visit the 85C prototype was taken to the Cranfield College of Technology for crash test destruction. First they wrote off an 84C as a baseline, then the 85C to check the improvements. *"It gets expensive, of course, but if you are saving lives it's peanuts."* The Royal Aircraft Establishment at Farnborough, one of the world's leading safety establishments, is also co-operating on aspects of driver safety (Peter Jowitt, the Formula 1 safety scrutineer, is employed at Farnborough and is involved in the research).

## WITH SCIENCE ALONE YOU MAY BE A RUNNER IN THE FIELD, BUT YOU ARE NOT A WINNER.

March's aerodynamics team led by Tino Belli is busy, too, testing every other week for a week at a time. They use three wind tunnels which have different characteristics, and keep up this level of research for most of the year.

*"When I was at McLaren Racing I was the designer of the cars, with an assistant,"* says Herd. *"That was the old concept, though, when one man took responsibility for all aspects of the design. Today it is more like the aircraft industry where the whole team works together to produce the winning design. For instance we have a performance engineer assigned to each category, whose job it is to attend the races and come back with bright ideas. We discuss these, develop them and incorporate them in the design."*

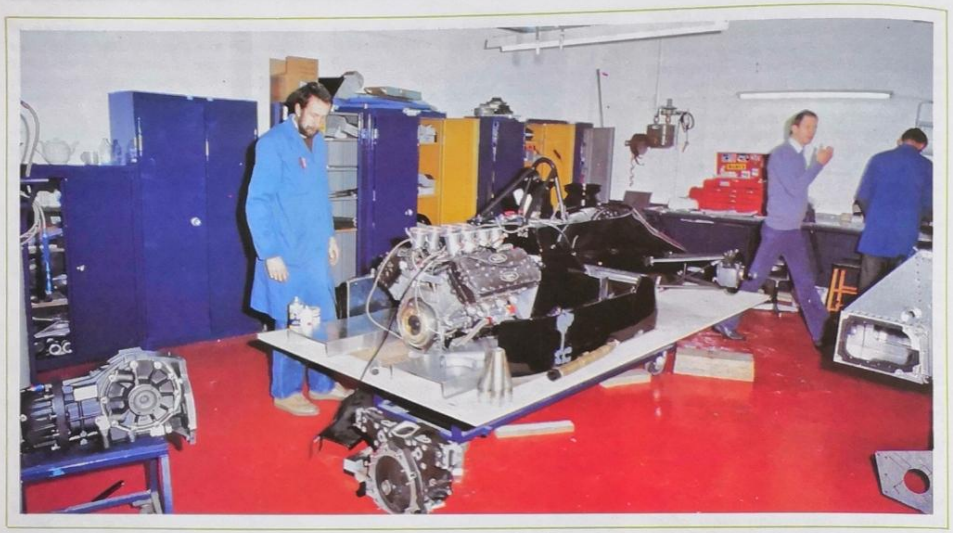
Herd, who is 45, made nearly 200 flights during 1984 and covered nearly 200,000 miles in the air, a non-stop world tour of business and technical development, and had not stood at his drawing board for several months. Despite the disappointment of losing the CART Championship (*"a source of embarrassment, but Carl Haas has a super team"*) Herd can look back on more than 20 victories in the past four seasons, while in IMSA racing the 83G and 84G have accounted for 18 victories, Al Holbert taking the '83 title and Randy Lanier the '84 title.

Despite the talent, the value of computer controlled equipment and the volume of high quality products, March Engineering still operates out of four small buildings cramped together on an industrial estate, hardly designed to impress visitors. Despite a tempting offer from the state of Indiana to move his entire operation over there, Herd says he wants to stay in Bicester for sentimental reasons since that is where he, Max Mosley, Alan Rees and Graham Coaker (whose initials form the name of March) started up in 1969, *"a giant hoax"* as some people put it, with a blaze of publicity and little in the way of products. Sheer nerve pulled them through, and in 1970 Jackie Stewart brought March close to the Constructors' Championship with a 701 chassis run by Ken Tyrrell.

The next year March had their own Formula 2 team comprising Niki Lauda, Ronnie Peterson, Jean-Pierre Jarier, James Hunt and Mike Beuttler, and though they took a monopoly on F2 in the 1970s they never again took a leading role in Grand Prix racing, concentrating on the main business of selling racing cars by the dozen.

Eric Broadley's large factory at Huntingdon, in the flat lands of Cambridgeshire, is altogether bigger and more impressive, but operates in a totally different way. *"We have to keep our sense of perspective"* Broadley will say. *"A racing car is not like an aircraft, it only has so much surface area and there is*

***F3000s to the fore and IMSA GTPs to the rear.***



*A perfect example of a well-lit, spotless and uncluttered workshop.*

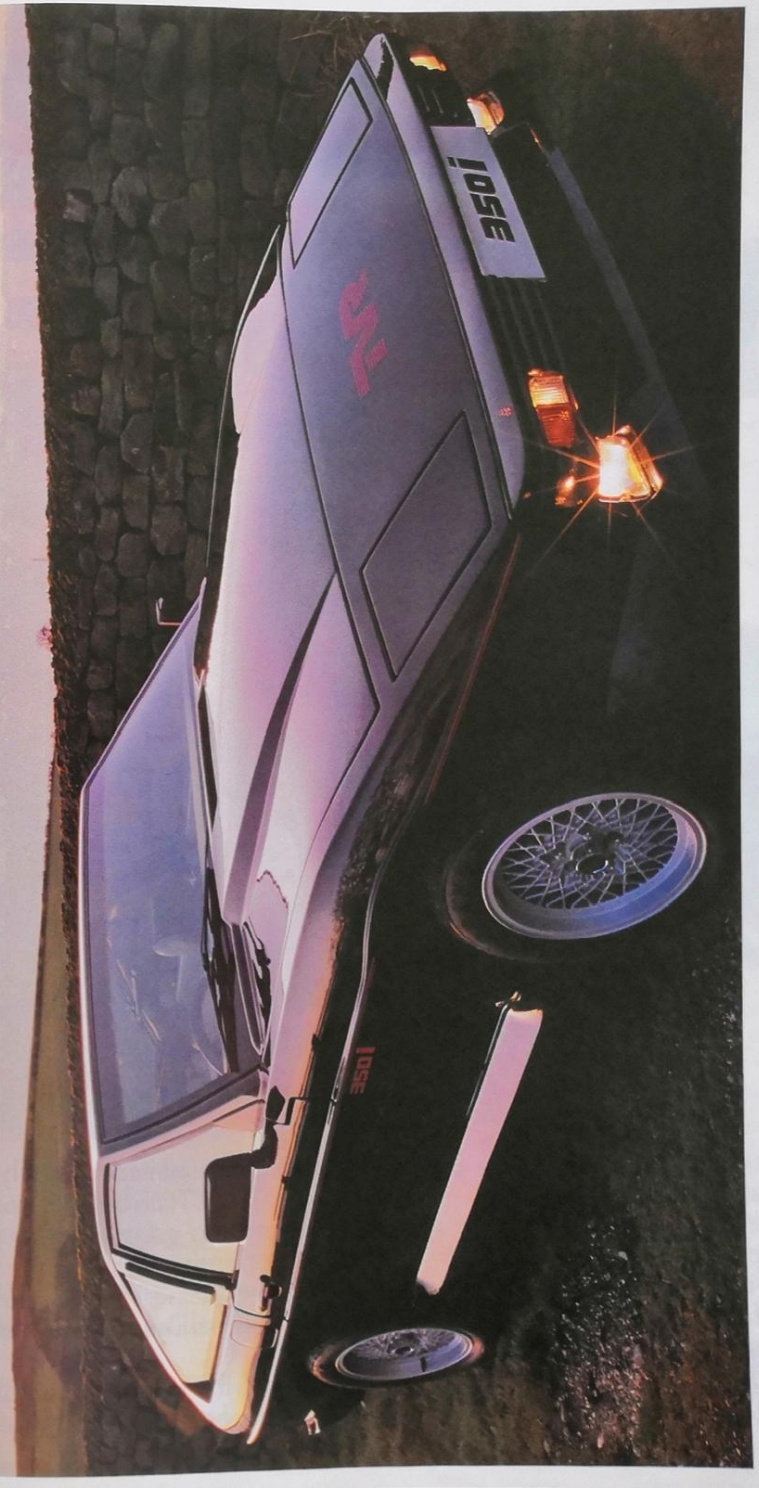
*only so much you can do with it."*
His new T900 CART contender is a development of the T800 and 801, a comparatively recent design which took 18 months of Broadley's time assisted by ex-Firestone engineer Nigel Bennett. Broadley has cut down on the travelling now, at the age of 56, saying that he does not enjoy the racing any more. So Bennett does the development work, and they admit that the T900 is a little heavier than its predecessor, though better and certainly stronger in the footwell area.
Lola won at Indy as far back as 1966, when Graham Hill and Jackie Stewart formed a two-car team and Hill came through to a somewhat lucky victory in the *"Red Ball Special"*. Honda's Formula 1 chassis was a spin-off from the Indy car, while four-wheel drive was a later development converted into a normal rear-drive car *"which George Bignotti copied, down to the last nut and bolt, to win at Indy a couple of times."*
Lola did not return to Indianapolis until 1979 with Jim Hall's team, and Al Unser that year, won all the 500-mile races *"Yet there were virtually no sales, no interest at all, so we pulled out again. Then March went there in 1981 after CART was formed and the situation was transformed: there were more teams, more sponsors, they were more professional and the whole thing had become much more viable."*
Broadley agrees that racing car design is becoming more and more scientific, and foresees that computers are going to play an increasingly important role, *"but only as a tool, to make more things possible in a shorter time."*
Intuitiveness rules, says Broadley, not science, and innovation is still the key; this and lateral thinking are absolutely vital. *"With science alone you may be a runner in the field, but you are not a winner."*

## A RACING CAR IS NOT LIKE AN AIRCRAFT, IT ONLY HAS SO MUCH SURFACE AREA.

Broadley, who once had top Formula 1 designers Patrick Head and John Barnard working in his design office at the same time, now has Bennett and three more engineers working for him... but not an aerodynamicist, though they all take turns at the Imperial College wind tunnel in London, part of the University. Broadley himself still spends time at his drawing board *("too much time, really")* where Herd spends none at all, and though he delegates as much as possible it is still his experience that has the last word. *"All designers go through phases, and the best ones don't always look so good in their formative years."*
On the race tracks, where the ultimate worth of the design is proved, Broadley concedes nothing. *"This is a very competitive business, very dynamic, and you must be on the ball the whole time. You cannot sit back and take the odd day off... if you want to do that, it's time to get out.*
*"Basically we are running our business with too few people working under stress, and that's our strength, too. We are competing the whole time. If you set up our business like an aircraft industry it would take ten times as many people to do the same job, and cost more than ten times as much. Most people are too sane to work the way we do!"*
For all his success with single seaters, Eric Broadley is perhaps best known for his sports car designs. He started off with the 1100-Climax in 1956, which consistently beat the Lotus 11, and went on to greater things. The trend-setting Lola GT which raced at Le Mans in 1963 was the forerunner of Ford's GT40 then came the T70 endurance and Can-Am cars, the T210 and T212 2-litre models, all classics. *"I always designed the sports cars myself because no-one else wanted to do them; the young ones always wanted to do the Formula 1 designs."*
Alongside the T710 (Chevrolet Corvette) which Broadley thinks should have won the '84 IMSA Championship had General Motors been ready, Broadley has developed the T810 for Electro Motive. This is a similar design, though different in the cooling arrangements, accepting Nissan's V6 Turbo, though replicas will be made to accept a variety of engines.
When Robin Herd says he needs a calendar with 18 months in a year he speaks for Eric Broadley as well: it takes six months to do the basic design and development work, six months to build a series of cars and the season lasts six months. Inevitably the programme has to be condensed, so that designs for the 1985 cars commenced last March. Prototypes were complete in November just as production of the customer cars was about to start, with deliveries due for completion in May.
Broadley sums up his business: *"We have got to be very careful in this game; we're at the mercy of trends, commerce and markets. It isn't easy to make money consistently. You might make a lot one year and very little for the next two or three, so you have to be very sure about the way you expand."* ■




So scarce it makes Ferraris look like Cortinas.




In an age when cars are turned out by robots in a matter of hours, the new TVR 350i Fixed Head is a glorious exception.
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# STEFAN JOHANSSON
# THE HEIR APPARENT

**THE TRAGIC DEATHS OF PETERSON AND NILSSON LEFT A GAPING WOUND IN THE WORLD OF F1. AFTER A MERE HANDFUL OF GRANDS PRIX, STEFAN JOHANSSON HAS PROVED HIS NATURAL GIFT FOR RACING AND APPEARS TO FULFILL THE REQUIREMENTS TO TAKE OVER FROM WHERE THEY LEFT OFF. THE INHERITOR COMES OF AGE.**

*by Patrick Camus*

The long and winding road to F1 has been full of pitfalls for Stefan Johansson. Every year, just as the target came into striking distance, it would fade away like a mirage in the desert. The vision of a works oasis for which you would only too willingly shed blood, sweat and tears to calm that burning desire for success. Every year, the Scandinavian had to suppress any doubts he had concerning his driving skills as he made his way along the treacherous road. His confidence both in himself and in his friends steadily grew, yet he almost yielded to dispair three times. On three occasions his hopes were crushed and each time he reacted differently — tears at the age of eight, anger when the 1984 F1 season kicked off without him and fatalism when Tyrrell offered him a drive, only to have FISA declare that the British constructor's cars were not conform.

Stefan Johansson has the striking looks of a Viking with his blond white hair, darting steel blue eyes and athletic build. The Swedish driver is a man of perpetual contrasts. He can look worried as he tells a joke and then burst into peals of noisy laughter as he reminisces over his past problems. He is alert and sharp-minded. His racing record is a long one.

At the tender age of eight, Stefan was already a keen racing enthusiast. *"School for me began on the circuits. I'd accompany my father who used to race a Mini Cooper and then a VW in Production. I would try — not very accurately! — to take his times and I was also in charge of cleaning the rear view mirrors. I often hear my colleagues talking about an early passion for cars. I was really a precocious child!"*

Like all young motor racing fans he was attracted by the noisy and colourful cars admired by the crowds. *"When I grow up I want to be a racing driver!"* Stefan didn't have to wait as long as most youngsters — his father was there right behind him. *"My boy's going to be a racing driver!"* he would proudly proclaim for all to hear.

One bright day, Johan Senior came home with a go-kart. *"I couldn't wait for the day we'd go and try it out on the circuit. I must have been eight at the time. I was out playing with some friends in a boat on the Vaxjo Lake not far from home. My father searched high and low for me, but in vain. He went to the track without me. When I got home, my mother told me the good news (for her) and I promptly burst into floods of tears!"*

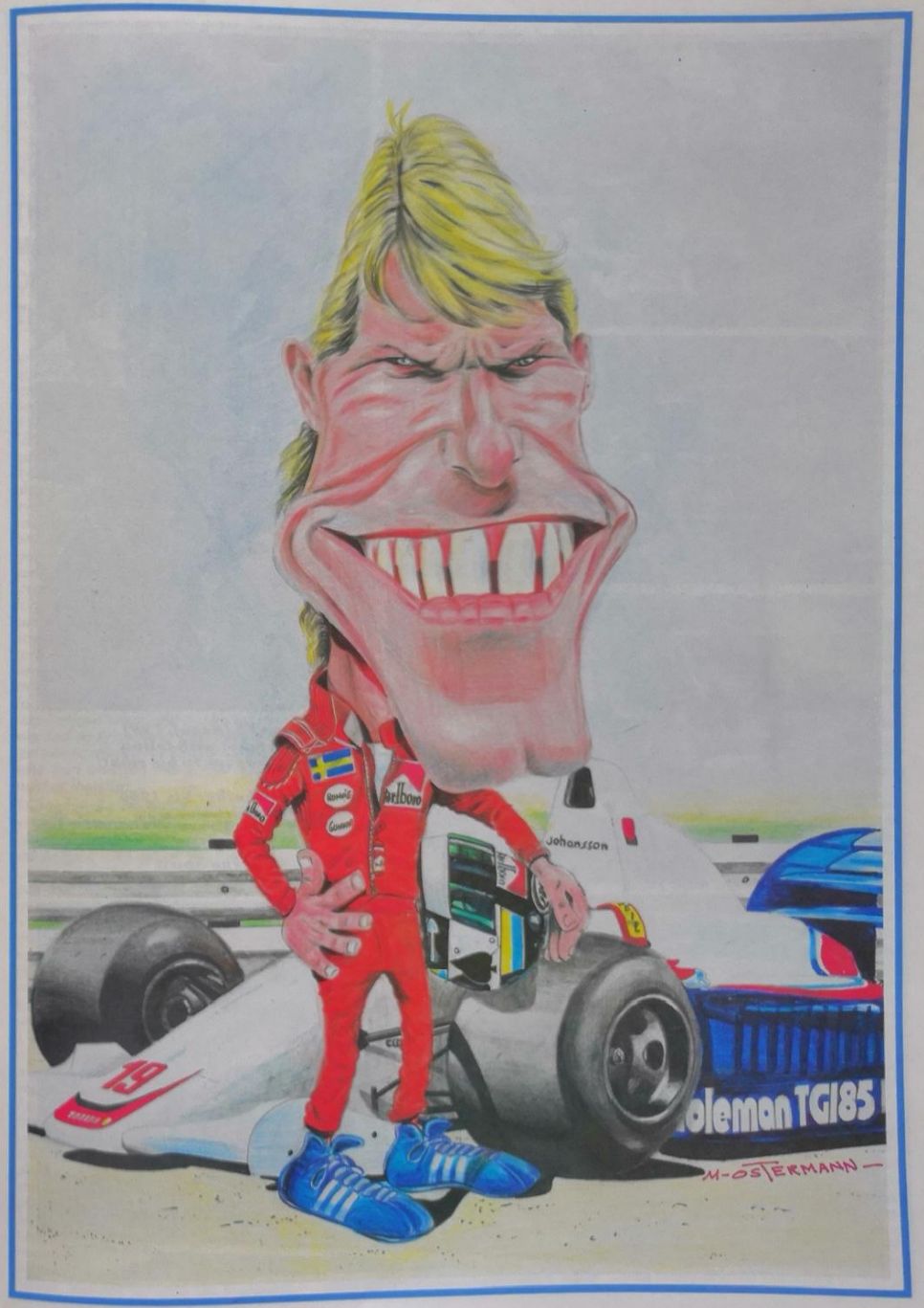
## MY BOY'S GOING TO BE A RACING DRIVER!

'Little Leaf' quickly made up for lost time and within a year he had mastered the basic techniques of driving a go-kart. Three years later, he took part in his first competition. He stood out during his teens for his acrobatic and proficient style. Some onlookers went further saying that he had the makings of a Nilssen or a Peterson. They too, had started out racing go-karts — a sport where skill, willpower, agressiveness, determination and dogged perseverance are the operative words. A gifted young driver and full of promise. His first climb up the rostrum steps came at eleven. By seventeen he was both the Swedish and Scandinavian champion. Then it was on to the world series the following year where he was up against the stars of the time — Patrese, Cheever, de Angelis and many more. He didn't see much point in continuing in go-karts. Firstly, it was costing him a small fortune in material and travelling expenses and secondly, he didn't stand much chance of being crowned without belonging to a works team. Time indeed to try something else...

Johan Senior helped his son buy an old Formula Ford Merlyn MK11 in order that he pit his talents against the national experts during the second half of that season. *"I felt that I had acquired a fair amount of experience from racing go-karts and I didn't think that I was going to have to change my driving style so radically. That car was really difficult. Its reactions were completely the opposite from what I normally would have expected. If you go too fast into a turn with a go-kart, you brake, allowing for a bit of oversteer and apply opposite lock — and you're through. When I tried doing the same thing with my FF I would find*







*1977 Monaco F3 (Argo), 1981 Pau F2 (Toleman) with fellow Swede Elgh forever to his right!*

***Hard to say whether his 1980 F1 Shadow experience was beneficial or not.***

***At the wheel of the Spirit Honda.***

*myself sliding out across the track and then backwards onto the grass for another 100 yards. It never failed!"*

With four races behind him, Stefan then moved into Formula 3. *"I was offered a fourth or fifth-hand Brabham BT35 which I just had to buy. I knew the owner quite well. His wife went out one morning to buy some matches and never came back. The poor guy was so upset that he almost gave it to me."*

## THAT RACE WAS UTTER MADNESS. I NEEDED A PAIR OF BINOCULARS TO SEE THE STARTING LIGHT!

Johansson fitted a Formula Atlantic power plant to the BT35 which seemed rather odd and, as expected, didn't provide any brilliant results. He decided it would be preferable to hire a reliable F3 GRD 375. Nothing ventured, nothing gained — Johansson finished fourth that year in his home championship. He also had a drive in an international event on the circuit of Knustorp. *"That race was utter madness! I found myself on roughly the 82nd line of the starting grid — I needed a pair of binoculars to see the starting light! I got off to the best start of my career. I was 3rd at the first turn! I tell you, it was sheer madness! I suddenly felt really odd. I was overcome with a feeling of power and superiority, so much so that I didn't even brake. I thought that I was going to get through like that. I eventually put my foot down, but it was too late. I clanged into Patrese's rear and out he went! He wanted to know who had paid me to get him to retire! I replied by asking him who had paid all those who'd let me past at the start."*

Stefan hired a Modus M1 the following year and started measuring his talents abroad against the likes of Gabbiani, de Angelis and so on. He finished an honourable 7th at the Paul Ricard circuit and went on to discover the thrills and excitement of the Nürburgring, which for him have disappeared since the circuit was rebuilt. He was fourth fastest in the first practice session and dropped down to 23rd during the second, then heavy rain began to fall just before the start. *"The driving conditions were atrocious, you couldn't see a thing. I wasn't put out in the sightest. In my opinion, the 'Ring is THE circuit 'par excellence'. A challenge in itself. It's tough and exacting. The kick you get from getting past a competitor or even the satisfaction from having simply completed a lap is terrific. All I could see was a thick sheet of rain and fog. I felt confident. Then, I suddenly got into a skid in the north curve and spun off into the guard rails. A historic crash for the Modus — a complete write-off. I was sad because she was a great little racing car."*

Johansson's finances also took quite a knock. But not for long. Jo Marquart, the Modus's constructor and Jordan from Anglia Cars were soon to make their entrance in Stefan's life. Modus had disappeared and had made way for Argo . It was agreed that the Swede salvage any accessories on the crashed Modus and build a JMI chassis around them. There wasn't much left to salvage: the rev counter, the brake discs and the oil pressure sender — and that was it! The Argo had its first race at Monaco as the prelude to the GP. It wasn't exactly a happy event for the Swede as he tangled with Schlesser fighting for fourth place. *"Somebody had to take the blame and I was appointed by everyone. The organisers, the AC Monaco, wrote to me saying they never wanted to see me race on their circuit again! Things have changed since and I'm always given a warm and cheerful welcome."*

Despite his shoe-string budget, Johansson scraped enough cash together to enter six European races. After each round, it was back to Sweden to search for more money to go for the next. At the time his friends were all saying how much easier and less expensive racing was in England. So, in 1978, Johansson set out for a new life and new friends. Marquart and Jordan were still firmly at his side, as well as Berbrö, Peterson's widow who kindly put him up in her home in Maidenstone and there was also Stefan Svemby, Ronnie's team manager.

## THE AC MONACO WROTE SAYING THEY NEVER WANTED TO SEE ME ON THEIR CIRCUIT EVER AGAIN!

Once the first race was over, Stefan found himself penniless yet again and returned to Sweden to forage out some money from somewhere. With relentless optimism, he forked out £1,000 here and £500 there. He put on a superb display of his talents at Donington when he came in second behind Derek Warwick and generally gave a good impression of his abilities throughout the year.

It all began to seem worthwhile when Marlboro offered him a small budget in 1979 and he was taken on by the McMahon team. His first drive was in a Chevron and then he went on to drive a March 793. He was lucky enough to be given a drive at a Formula 2 round.

Johansson was further given a chance of demonstrating his skills when Marlboro increased their budget sufficiently for him to be taken on Ron Dennis's F3 Project 4 team. *"I began with a March as I had been most impressed by its performances the previous season. Unfortunately, it had already been superseded by the Ralt by then."*

There was no stopping Stefan once he'd come into possession of the Ralt. He claimed victory after victory and was crowned the British F3 champion. He'd been in F3 for quite some time but people were now taking notice of him. That was in 1980 and that same year, he was given a drive with the Shadow F1 team, much to the pleasure of his loyal friends. However, it turned out to be an anti-climax. *"The team was going downhill and I knew what I was letting myself in for. I'll always be eternally grateful for the Argentinian and Brazilian GPs which I enjoyed immensely. Who wouldn't? — I'd never driven anything so powerful before! Everything seemed out of proportion. When I go over what happened, I still can't make out if it was because of the car or because I hadn't grasped the meaning of the situation I was in that I didn't qualify, I like to analyse the outcome, be it a win or a failure. I'm not one of those people who make excuses the whole time or blame their tools. On the other hand, what are you supposed to do if you really do have uncompetitive material? Anyway, I've no regrets and I'm glad I didn't miss the chance, not that it led to anything else, mind."*

## I HAD TO RESIGN MYSELF TO THE FACT THAT MY F1 DAYS WERE NOT FOR STRAIGHT AWAY

The prestige of wearing the 1980 British crown was convincing enough for Toleman to include Johansson on his team for the 1981 European F2 championship. He chalked up two wins and finished 4th at the end of the year. Then, it was on to Spirit in 1982 and the Honda V6. It was an extremely powerful but fragile racing car. During that season, he took pole five times out of the first eight races, but only finished twice in the points. The winter of 82/83 was bleak and gloomy. Stefan offered RAM his services but didn't fancy his chances very highly. He spent most of his time with Boutsen testing Wickham and Coppuck's Spirit Honda which they were hoping to enter for the 1983 F1 season. One car, two drivers. Who was going to be the lucky one? The Japanese finally gave their go-ahead in March and much to everyone's surprise, Johansson was picked. His joy was short lived because the Spirit was far from perfect and was still going through teething problems. The usual problem of inadequate funds made its appearance and Coppuck had to make do with modifying an old F2. The team's best result that year was a 7th place in Holland. Honda then transfered their backing to the Williams outfit which meant that Spirit's only chance lay with clutching at the Hart engine. Even that had to be replaced by a Cosworth when the F1 circus went over to North America. Johansson didn't take it badly at all when Baldi was given the drive. The Italian soon had to leave his place to Rothengatter who had the necessary readies. As for the Swede, he was firmly against the policy of 'first in

*I quite enjoy Endurance.*

with the cash, first served'. *"I'd already done three seasons in F3, two in F2 and my first season in F1 had backfired. I didn't want to leave Spirit but I didn't have much option. I couldn't provide the money they were demanding. Nothing could have been more impossible for me at that time. Stupendous sums of money are required to survive in the F1 jungle. They're all crazy. I mean, it's not as though providing the money automatically means that you no longer have to prove yourself. I often wondered during the 83/84 close season what it was that I'd done so terribly wrong that no-one would offer me a drive. The only reason I came up with was that I hadn't found myself a huge generous sponsor. So, once again, I had to resign myself to the fact that my F1 days were not for straight away. As I was still on excellent terms with Honda Japan I did a whole season in their national F2 championship. I also did a bit of Endurance in a Joest 956 whenever I was free of my commitments. I quite enjoy Endurance, in the same way I enjoy anything to do with motor racing.*

*"I couldn't believe that the 1984 F1 season would be starting without me. I felt really disheartened. Mind you, I got a lot out of my Porsche experience and that was how I met Bob Wollek in 1983 — a great guy. He's one of the best drivers around and a really nice person to know. It was a pity that we couldn't team up together for the 1984 WEC. If he'd believed in himself more, I'm sure he would have made the grade in F1, the skills and the ability are there. When you talk about it, he just shrugs his shoulders and that's it! Until a couple of years ago, you were considered a bit of a fogey if you started out in Endurance. But that's all changed now. OK, you have to be more careful in Endurance than in F1 because the races are that much longer — you can't do a 24-hour sprint but there's been a levelling-up of performances. If you're at the wheel of a top Endurance car, you can now keep your foot down hard to the floor the whole way."*

Discouraged, Johansson was forced to admit that the 1984 F1 season would be kicking off without him. A few days prior to the British GP, his phone rang. Tyrrell wanted him to replace Brundle badly injured at Dallas, for as long as was necessary until Brundle was pronounced fit to drive again. Tyrrell had even acquired the backing of a new sponsor, Systime computers who believed in Brundle's abilities. They agreed to Johansson replacing him in view of his close connections with England. *"I was in fine spirits when I got to Brands. Imagine my dismay when the Tyrrells were not allowed to start! For once I had been given the chance of driving a good car and then look what happened!"* What happened next is old news now. The High Court in London allowed Tyrrell to race his cars in the British, German, Austrian and Dutch GPs whilst awaiting the verdicts from FISA and FIA. An accident at Brands, 9th at Hockenheim, unqualified at Zeltweg and 8th at the Dutch round.

Then Johansson was back in the dumps as the Tyrrell was banned. It's difficult for Stefan the driver to give a really honest opinion on this affair. *"One thing that no-one can deny, is that Ken's got a fantastic team together. They're all great people, from the mechanics to Ken himself. Ken is a real father-figure to his drivers and I found that touching. I liked having Bellof as my team mate and we've been up to quite a bit together since our F2 days. Neither of us hide any tricks, or anything else for that matter, from the other. When we didn't qualify in Austria, we both went to forget our cruel fate in the hotel swimming pool. Getting back to Tyrrell, I don't really know what happened before I joined the team. I didn't even want to read any of the articles that were written on the whole affair. I'd rather not get involved and just concentrate on the driving. At that particular point in time his offer seemed like my great chance to shine."*

## THE UNDERSTUDY HAD FINALLY BEEN ASKED TO ACT

Big Ken never lost hope despite everything and spoke of the future. To both Bellof and Johansson. *"He promised us turbos and a new car. But I had to know quickly where I stood. At the same time I was keeping in touch with the people at Toleman. I was on excellent terms with Alex Hawkridge and Chris Witty; our friendship goes back to my F2 days. Their team seemed to be set on the right path for success."* Other offers also started coming in. There was Williams for example. Honda were undoubtedly behind their choice. Slowly but surely, his two contacts became firmer. Toleman asked him to stand in for Senna at the Italian GP. Williams wanted him to test drive the FW09. Stefan now had to decide between choosing a highly-rated team and going through the problems all 'number two' drivers have to encounter or, being equal top driver for a team still striving to get into the top level bracket. In the end, Stefan finally signed on with Toleman. His contract binds him for 1985 and 1986. At Monza he was visibly a changed man. The understudy had finally been asked to act. He also had what must surely rate as being the most memorable race of his career. He started out in 17th position on the grid and crossed the finish line in 4th, pushing the car over as one of the wheel bearings had gone.

Some who were at Estoril say that his blazing desire to win led to impulsive and ungoverned driving. Did he not push Lauda into taking unnecessary risks? *"I drove as I always do — to the best of my ability. I was concentrating on my lines into the turns and on the mechanicals. I didn't give the others a thought. I'd been pushed to the background for too long. Toleman had shown that they believed in me and I owed it to them to prove that I was indeed their man. The only way to do that — to prove your worth — is to go fast and sometimes that involves being ruthless."* Johansson has proved two things along the long and winding road that has finally led him to F1. His driving skills and the way he looks upon his career as a driver. *"When I went professional I never for a single moment envisaged the idea of having to pay for a drive. I wasn't going to pay but be paid!"*

Well, perhaps that's why Stefan has spent so many years striving hard. He's all the more motivated now that he's finally got to where he wanted. It's up to him to prove himself. ■

SWEDISH RALLY

# THE NEW KING OF BJALVERUD

STIG BLOMQVIST ONCE DECLARED, "THE DAY SOMEONE'S FASTER THAN ME ON THE BJALVERUD STAGE, I'LL WANT TO KNOW HOW." ARI VATANEN, ON HIS WAY TO WINNING HIS FIFTH WORLD CHAMPIONSHIP RALLY IN A ROW, DID JUST THAT.

*by Michel Lizin*

The 13½ mile Bjälverud-Gräsmark stage is one of the Swedish classics. It is also Stig Blomqvist's favourite, not just in Sweden but in the world, a sort of private hunting ground where other drivers nearly have to ask the Swedish driver's permission to compete on it. The stage is fast, undulating and varied and it is here that Blomqvist comes to practise between rallies and to test his cars. He knows every centimetre by heart.

The Bjälverud stage is, for this reason, psychologically important for Stig. It was here that, during the 1984 Swedish, he dealt a demoralising blow to a Per Eklund who had had the audacity to have been in front of the *'Bjälverud King'* during the early stages. Ari Vatanen knows as well as anybody the importance of the mental aspect of rallying. In 1985, if Blomqvist could have managed to be ahead after Bjälverud then he might have been unbeatable. But what if the Peugeot driver was faster than the Swede on that stage? Without any undue fuss, Ari went out and practised Bjälverud over and over again, more than any other stage, during recce. To observers this was his way of being able to get near Blomqvist's time on the stage... or whas he possibly hoping to be faster?

## THE SUCCESSOR

Unlike last year, the Bjälverud stage was held in darkness at around 8.30 in the evening. The temperature has rarely been as low during the Swedish Rally with thermometers hovering around the -25° C mark. Blomqvist is not the only one to like the stage. The spectators, too, appreciate its long fast curves and are always out in number, lining the route and lighting fires to keep warm. The Swedish spectators are not ones to show their enthusiasm nor do they manifest any particular preference for their favourite drivers. You're lucky if they look at the programme to proclaim indifferently, *"That was Salonen."*

Blomqvist's record of 11m 57s had stood for twelve months, a time achieved in daylight. This year, in the dark, Stig was only a second slower at 11m 58s with the Audi Sport Quattro. A fine performance. Then Vatanen's time came through : 11m 49. The damage was done. The Finn's lead was increased from 33 to 42 seconds in one fell swoop. The Swedish driver, his pride hurt, opted for a change of rubber for the following stage and lost a further 29 seconds which left him 1m 11s behind the Peugeot driver by the end of the first day. The Rally had only just begun but was already more or less in Vatanen's pocket.

## ATTENUATING CIRCUMSTANCES

In Blomqvist's defence, his driving skills cannot be criticised. If the Rally had lasted 15 minutes or ten days, his Sport Quattro would have been no match for the Peugeot 205 Turbo 16. For fast stage times, Vatanen and Salonen just had to keep their cars on the road. For Blomqvist and Röhrl, it was more a question of a constant fight with the car.

From the stage-side, the difference is striking. Going into a bend, for example, the Peugeot brakes in a straight line. With nothing more than the slightest of turns of the steering wheel, the car is set up for the bend and the driver places it where he wants. The nose of the Peugeot follows the apex and the slide is perfectly controlable with the accelerator. With the Audi it's different. To get the car set up, you need to give a great pull at the wheel in the opposite direction to the bend. You then have to literally throw the car into the bend and accelerate hard. At any moment the rear-end of the car could go into a slide and lots of opposite lock is required to keep control. The above description is no exaggeration. The characteristics of the Sport Quattro are perhaps the main reasons for its difficult handling. The short wheelbase, the overhanging front engine, the low rev range and the brutal way in which the turbo comes in could all have something to do with it. But, again, there are attenuating circumstances. After the Monte Carlo Rally, Roland Gumpert declared that the Audi Sport Quattro had every chance of keeping up with the Peugeot in conditions where an ideal suspension set-up could be fitted throughout the rally. The Swedish was to have been the first chance to test this theory. In Sweden, the Audi was again beaten... but the snow conditions were not the same throughout the event.

As journalists and spectators arrived at Karlstad the day before the Rally, there was a surprise waiting for them. The continuous passage of crews during recce had left a fair part of the route without snow. It is true to say that practice isn't something that has been invented since last year but Bröt Danielsson tried to explain why this year was different.

## THE ROLE OF THE WEATHER

*"The snow didn't come until very late this winter, around mid-January. Usually what happens is that the snow falls earlier, melts a little, then refreezes to form a cover of frozen snow or even ice. Even the studded tyres on today's rally cars can't break through this rock-hard layer. The snow that follows settles on this ice and protects it even further. This year, the snow started very late and then it froze almost immediately. OK, that gave a frozen support for the snow that followed but without the traditional protective layer. The first cars through the stages during recce literally brushed the snow aside, creating tramlines and mixing gravel to the snow that remained."*

The 1985 Swedish Rally was, for this reason, very difficult for the drivers. The gravel-strewn tramlines made steering very arduous and the constant changes in surface conditions meant that drivers had to be particularly alert at all times. More importantly, for Gumpert and Blomqvist at least, it meant that the expected Vatanen-Blomqvist battle just didn't take place. Both the Audis and the Peugeots were on Michelin tyres. The Michelin technicians had specially developed compounds based on pre-rally testing in conjunction with both manufacturers. The result of these tests was the C6 and C8 rubber destined for use on the uniformly deep snow you always get in Sweden... except in 1985! On gravel, the tyres suffer a lot more than on snow but, and this is the crucial point, they suffer less on the Peugeot than on the Audi.

*"It only needs two gravel bends to be taken under acceleration and the damage is done,"* explained a Michelin technician, *"The studs on the front tyres of the Audis break loose while they remain intact on the Peugeot."*

It is easy to understand why. The Audi Sport Quattro is heavier than the Peugeot and the mass on the front tyres is a lot greater on the Audi with its overhanging front engine. The Audi, too, is more powerful (400 bhp) and 50% of its power is transmitted through the front wheels, ie 200 bhp. The Peugeot, however, 'makes do' with 350 bhp, of which only 33% goes through the front wheels, ie, 120 bhp.That means that the Audi's front tyres have to cope with over 60% more power than the French car's. The difference is enormous and, after only a couple of hard accelerations with only slight opposite lock, the Audi drivers soon found themselves without studs.

*"It's interesting to note the times for the sixth stage,"* continued the Michelin technician. *"All 30 miles of the stage were covered with snow and the studs held out on both cars. Blomqvist's and Vatanen's times were nearly identical with the advantage going to the Swedish driver by just 5 seconds. Both drivers were nearly a second a mile faster than their main rivals."*

The two drivers were timed at the halfway point of the 12th stage. Blomqvist was leading by 11 seconds. At the end of the stage, Vatanen was 6 seconds faster than the Audi driver and Blomqvist claimed that he hadn't committed the slightest driving fault!

## A DEMONSTRATION OF SKILL

*"I've got no excuses,"* admitted Hannu Mikkola at the finish of the Rally. *"The others were quicker and that's all there is to it, I was off the pace. The Peugeot is the best rally car at the moment. That's why I think Stig's performance was so incredible. The Sport Quattro is a very difficult car to drive, with a wider track than the tramlines. The car kept jumping out of the rails forcing us to make corrections to our trajectories all the time, not to mention the constantly changing surfaces. I really don't know how Stig goes so fast in such conditions."*

Timo Salonen had set himself the target of *"doing better than on the Monte"*. He finished the Swedish round in third position and, after the Rally, admitted that he still didn't quite feel at ease with the 205 Turbo 16. *"I'm still in the*

***Stig Blomqvist came an honourable second. There was nothing he could do against the Vatanen/Peugeot tandem.***

## TEAM BY TEAM

Once again Peugeot and Audi are there to fight it out. The French team is comprised of Vatanen/Harryman and Salonen/Harjanne who will be using their Monte Carlo car. Power distribution remains a 1/3 front and 2/3 rear. Michelin have brought along a supply of C6 and C8 rubber, specially developed for the Swedish snow. Three official Audi Sport Quattros are available for Blomqvist/Cederberg, Mikkola/Hertz and Röhrl/Geistdörfer but the German manufacturer can also count on four *'classical'* Quattros in the hands of Eklund/Whittock, Lampi/Kuukkala, Wilson/Harris and Llewellin/Short. There are not many other competitive Group B cars at the start apart from the works Mazda RX7 of Ingvar Carlsson/Mellander, an Opel Ascona 400 for Mats Jonsson, a Ford Escort for Stig Andervang and a Renault 5 Turbo 'Tour de Corse' for Lars-Erik Walfridsson. However, Sweden is Group A country since Group B cars are not allowed to compete in the national championship. Main contenders include Audi 80 Quattros (190 bhp) for Mikaël Ericsson and Gunnar Pettersson, a works VW Golf GTi (170 bhp) for Lars-Erik Torph, Opel Kadett GSis (170 bhp) for Kenneth Eriksson and Ola Stomberg, a Mazda 323 Turbo (215 bhp) for Thorbjörn Edling, a Saab 99 Turbo (220 bhp) for Erik Johansson, an Opel Ascona (180 bhp) for Jerry Ahlin and Volvo 240 Turbos (280 bhp) for Brör Danielsson, Suzanne Kottulinsky and Berndt-Inge Steffansson. Last, but by no means least, Mark Lovell was present with his Ford Escort RS 1600i (150 bhp).

## THE RACE

There are 115 cars at the start of the 1985 Swedish Rally. As early as the first stage a picture is formed of how the Rally will go. Vatanen and Blomqvist are equal fastest on 2m 25s with Salonen 2s behind and Röhrl 3s. On the second stage, Vatanen lets Blomqvist know that he is looking for victory and takes 12s off the Audi driver in one swoop. Röhrl, in good form, manages to equal his team-mate's time whereas Mikkola drops 34s. *"It's been a long time since I've driven competitively,"* explains the Finn. *"I feel rusty."* Gunnar Pettersson is regularly best Group A driver with his Audi 80 Quattro. Slowly but surely, Vatanen increases his lead. At the Malung halt after 5 stages, he's already 25s in front of Blomqvist, 30s in front of Salonen. Röhrl is 48s behind and Mikkola 1m 10s. Lampi has been off with his Audi Quattro and has lost over 30 minutes. He finishes the first day in 47th position and does not show for the second leg. On one of the other Audi Quattros, Per Eklund is slowed by electrical problems. His alternator is malfunctioning and the reduction in current has upset the injection settings which results in a reduction in power. The problem is worse in darkness when the auxiliary lighting is used. Unfortunately, the Swedish driver's service does not have a replacement and a disappointed Eklund will have to do the whole Rally in these conditions. *"If my car had been working correctly, I would not have been able to better my final position,"* explained the Swede at the end of the Rally. *"I would only have been a little closer to the leading group. The Quattro has been completely surpassed by the Sport Quattro. Stig told me he was taking bends in third that I was taking in first."*

The Audi team is further weakened when David Llewellin goes off on SS 6. This very long stage, 30 miles, is completely covered by snow. Blomqvist makes a special effort and covers the stage at an average speed of 75mph. Only Vatanen can keep up with him losing only 5s to the Swede whereas the rest lose over 30s. Eklund's problems cause delays for Röhrl who manages to catch him, only to be slowed by the snow which is thrown up.

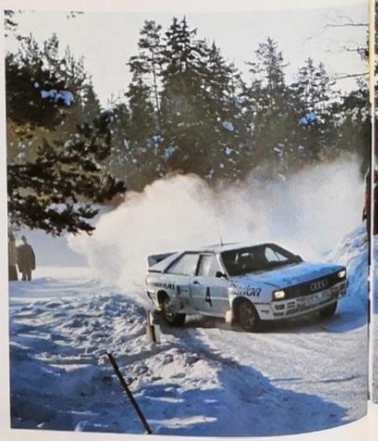
Vatanen's performance in SS 6 deals a blow to Stig who is further demoralised after the Finn takes 9s off him on his favourite stage, Bjälverud. Completely put out, Blomqvist asks for Michelin A3s to be fitted for the ninth stage. The choice proves to be wrong and Stig loses a further 29s. After managing to take the lead of the front-wheel drive clan, Ola Stromberg is forced to retire after an off with his Opel Kadett GSi.

At the end of the first leg, Vatanen is 1m 15s ahead of Blomqvist, 1m 51 ahead of Salonen, 3m 23 ahead of Röhrl and 3m 41 ahead of Mikkola. This group is followed by the Quattros of Eklund and Wilson.

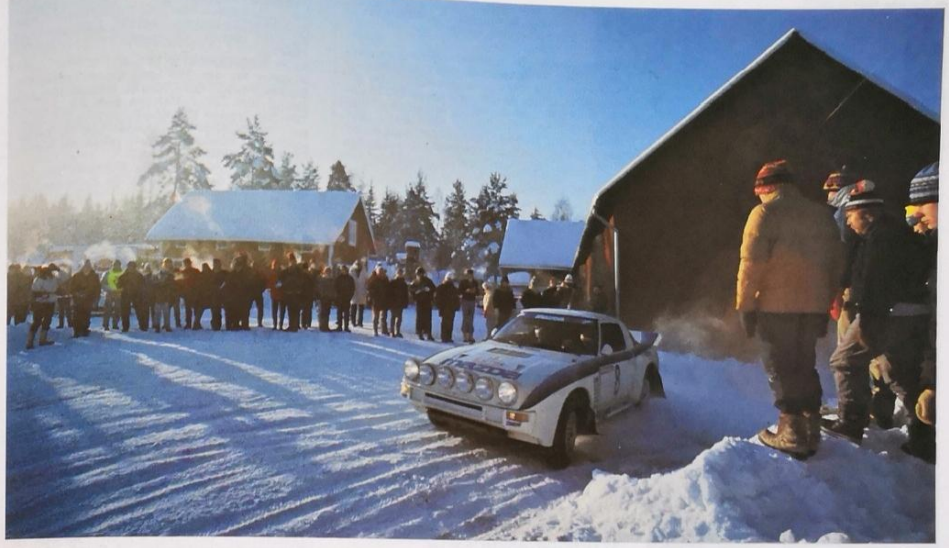
Snow is falling as crews tackle the first four stages of the second day. Blomqvist makes the most of it to take a little time off Vatanen, especially as both Peugeot drivers go off during SS 14, each losing 35s. Ari's lead is now down to 46s. Vatanen soon puts things back to normal though and takes his lead over Blomqvist to a minute on SS 15. Salonen is not really worried by Röhrl and, in any case, the German driver disappears soon after when his engine blows.

The tyres take a hammering on the stages that follow, as snow and gravel sections succeed each other. Malcolm Wilson's reserve of Taki tyres is melting faster than snow. To conserve what is left, he slows down but still manages to leave the road on SS 18 and retires. Gunnar Pettersson is locked in battle with Mikaël Ericsson's similar Audi 80 Quattro despite being handicapped by the snow being thrown up by slower competitors.

Vatanen completes the 3rd and last leg without any problems and is happy just to control the Rally, breaking the record of SS 25 by 1m 40, an improvement of over 3s a mile. Blomqvist retains his 2nd place in front of Salonen, Mikkola, Eklund and Gunnar Pettersson who manages to get the better of Ericsson after a fantastic struggle. There are 57 cars at the finish.



*Timo Salonen (above) was disappointed with his third place. Neither Per Eklund (left) nor Hannu Mikkola could match the pace of the leaders. Lars-Erik Torph (right) gave all he had at the wheel of his Golf, but it wasn't enough.*



***Three Swedish drivers and three different cars all out to impress on 'their' event: Lars-Erik Walfridson (Renault 5 Turbo), Ingvar Carlsson (Mazda RX7 Turbo) and Mats Jonsson (Opel Ascona).***

*process of learning but I'm getting better."*

To conclude, two drivers dominated the 1985 Swedish Rally: Ari Vatanen and Stig Blomqvist. This sort of two-driver combat is becoming a habit since the Peugeot 205 came onto the rallying scene. Remember the duels between Vatanen and Alen on the 1000 Lakes, Vatanen and Röhrl on the San Remo, Vatanen and Mikkola on the RAC, Vatanen and Röhrl on the Monte Carlo and, finally, Vatanen and Blomqvist on the Swedish. The common denominator? Ari Vatanen, the tall Finn, who took victory on all five occasions.

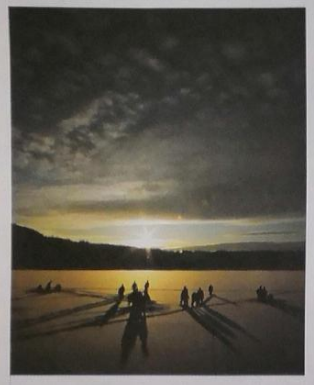
The performance of the Peugeot Talbot Sport team, five consecutive victories in five rallies, is a record and, once again, Vatanen reported no major mechanical problems. Only one turbo was changed on the car and that was purely a precautionary measure.

From the outset, the Peugeot 205 Turbo 16 has been ultra-competitive; its superior handling in long curves, thanks to a centrally positioned motor, helped it on the 1000 Lakes, its adaptability from loose to tarmac stages contributed to its San Remo success, its handling on the RAC's secret stages gave it the advantage over the Audi and the fact that the suspension could be changed in a matter of minutes meant victory on the Monte Carlo. In Sweden? Once again because its design offers the best compromise when surface conditions change on the same stage. Quality after quality! But, apart from the obvious talents of the Peugeot drivers and the infra-structure of the service team, there is one major factor that has contributed to the French team's success. The major competitors for the Peugeot, Audi and Lancia, are both capable of keeping up with the 205 in their particular speciality. The difference comes, of course, from the fact that the Peugeot is the ideal car in nearly all conditions... for the moment!

Although the members of the Peugeot Talbot Sport team will no doubt disagree, let's hope that Audi will manage at least one victory before the half-way point in the season so that the world title will not be decided too soon. And, to make the rest of the season interesting, let's hope that the other manufacturers will soon be ready with their cars. Peugeot have leaped ahead and they continue to progress. It won't be easy to catch up. ■

## RESULTS

**SS 1: BACK (4.56 km)**
**Blomqvist 2m 24s (at an average speed of 115 kph) (1st Group B)**, Vatanen 2m 24s, Salonen 2m 26s, Röhrl 2m 27s, Mikkola 2m 29s, Lampi 2m 32s, Eklund 2m 38s, **Pettersson 2m 39s (1st Group A)**, Wilson 2m 41s, Ericsson 2m 41s, Torph 2m 42s, Andervanq 2m 42s, Jonsson 2m 43s.
**SS 2: MANGSHYTTAN (18.16 km)**
**Vatanen 11m 18s (96 kph)**, Blomqvist 11m 30s, Röhrl 11m 30s, Salonen 11m 31s, Mikkola 11m 52s, Lampi 11m 52s, **Pettersson 11m 58s**, Eklund 12m 01s, Ericsson 12m 01s, Wilson 12m 12s, Jonsson 12m 23s, Andervanq 12m 24s, Carlsson 12m 27s, Fredriksson 12m 30s, Eriksson 12m 34s.



**SS 3: MALTA (11.82 km)**
**Blomqvist 6m 12s (114 kph)**, Vatanen 6m 15s, Salonen 6m 15s, Röhrl 6m 18s, Mikkola 6m 20s, Lampi 6m 25s, Eklund 6m 39s, **Pettersson 6m 40s**, Ericsson 6m 45s, Strömberg 6m 49s, Eriksson 6m 51s, Carlsson 6m 53s, Llewellin 6m 53s, Jonsson 6m 54s, Walfridson 6m 54s, Johansson 6m 55s.
**SS 4: ANDERSVIKSBERG (12.54 km)**
**Salonen 6m 20s (118 kph)**, Vatanen 6m 21s, Blomqvist 6m 23s, Mikkola 6m 23s, Röhrl 6m 29s, Lampi 6m 29s, Eklund 6m 40s, **Pettersson 6m 40s**, Wilson 6m 51s, Carlsson 6m 56s, Eriksson 6m 56s, Andervang 6m 58s, Johansson 6m 59s, Ericsson 7m, Torph 7m 3s, Ahlin 7m 3s, Blomqvist 7m 3s, Llewellin 7m 4s.
**SS 5: RAFORSEN (19.22 km)**
**Vatanen 9m 22s (122 kph)**, Blomqvist 9m 36s, Salonen 9m 38s, Röhrl 9m 44s, Mikkola 9m 46s, Eklund 10m 11s, Wilson 10m 22s, Ericsson 10m 26s, Pettersson 10m 29s, Strömberg 10m 34s, Andervang 10m 36s, Eriksson 10m 39s, Johansson 10m 40s, Jonsson 10m 42s, Carlsson 10m 43s.
**SS 6: GARDSAS (46.89 km)**
**Blomqvist 23m 33s (119 kph)**, Vatanen 23m 38s, Salonen 24m 3s, Röhrl 24m 22s, Mikkola 24m 23s, Lampi 24m 57s, Eklund 25m 28s, Wilson 26m 12s, **Ericsson 26m 29s**, Jonsson 26m 41s, Strömberg 26m 45s, Andervanq, 26m 48s, Carlsson 26m 54s, Torph 26m 57s, Johansson 27m 7s, Eriksson 27m 22s.
**SS 7: SAGFALLET (32.78 km)**
**Vatanen 16m 25s (119 kph)**, Blomqvist 16m 38s, Salonen 16m 47s, Mikkola 16m 56s, Röhrl 17m 14s, Lampi 17m 28s, Eklund 17m 54s, Wilson 18m 08s, **Ericsson 18m 21s**, Strömberg 18m 22s, Carlsson 18m 31s, Johansson 18m 33s, Pettersson 18m 34s, Eriksson 18m 38s, Torph 18m 42s, Jonsson 18m 43s.
**SS 8: BJALVERUD (21.59 km)**
**Vatanen 11m 49s (109 kph)**, Blomqvist 11m 58s, Salonen 12m 03s, Röhrl 12m 16s, Mikkola 12m 26s, Lampi 12m 30s, Eklund 12m 42s, **Pettersson 12m 57s**, Ericsson 12m 59s, Wilson 13m 02s, Carlsson 13m 04s, Jonsson 13m 11s, Johansson 13m 17s, Torph 13m 29s, Eriksson 13m 29s, Walfridson 13m 36s.
**SS 9: LANGJOHANTORP (20.84 km)**
**Vatanen 10m 53s (114 kph)**, Salonen 11m 09s, Blomqvist 11m 22s, Röhrl 11m 23s, Mikkola 11m 26s, Eklund 11m 54s, Lampi 11m 58s, Wilson 12m 04s, **Ericsson 12m 12s**, Carlsson 12m 13s, Pettersson 12m 18s, Torph 12m 20s, Jonsson 12m 28s, Johansson 12m 28s, Eriksson 12m 30s, Ahlin 12m 34s.
**SS 10: MARIEBERSSKOGEN (1.75 km)**
**Vatanen 1m 45s (60 kph)**, Blomqvist and Salonen 1m 49s, Mikkola 1m 50s, Röhrl 1m 51s, Eklund and **Pettersson 1m 53s**, Ericsson, Walfridson and Ottosson 1m 57s, Lampi, Ahlin, Steffanson, Gundler and Björn Blomqvist 1m 58s.

**STANDING AT THE END OF THE FIRST LEG**
**1. Vatanen/Harryman (Peugeot 205 Turbo 16) 1 hour 40m 10s (at an average speed of 115 kph) (1st Group B)**, 2. Blomqvist/Cederberg (Audi Sport Quattro) 1 hour 41m 25s, 3. Salonen/Harjanne (Peugeot 205 Turbo 16) 1 hour 42m 01s, 4. Röhrl/-Geistdorffer (Audi Sport Quattro) 1 hour 43m 51s, 5. Mikkola/Hertz (Audi Sport Quattro) 1 hour 43m 51s, 6. Eklund/Whittock (Audi Quattro) 1 hour 48m 00s, 7. Wilson/Harris (Audi Quattro) 1 hour 50m 45s, **8. Ericsson/Joansson (Audi 80 Quattro) 1 hour 50m 51s**, 9. Pettersson/Pettersson (Audi 80 Quattro) 1 hour 51m 35s, 10. Carlsson/Mellander (Mazda RX7) 1 hour 52m 31s, 11. Jonsson/Gustavsson (Opel Ascona) 1 hour 52m 51s, 12. Torph/Svanström (VW Golf GTi) 1 hour 53m 37s, 13. Eriksson/Throzelius (Opel K GSI) 1 hour 53m 46s, 14. Johansson/Olsson (Opel 1800 GTE) 1 hour 53m 54s, 15. Ahlin/Karlsson (Opel Ascona) 1 hour 55m 20s, 16. Blomqvist/Andersson (Opel 1800 GTE) 1 hour 56m 26s, 17. Waldfridson/Bäckman (Renault 5 T) 1 hour 56m 36s, 18. Kressner/Melleroth (Opel Ascona) 1 hour 56m 59s, 19. Fredriksson/Boden (VW Golf GTi) 1 hour 58m 14s, 19. Ottosson/Ostlundh (VW Golf GTi) 1 hour 58m 14s, 21. Gündler/Svanberg (Audi 80 Quattro) 1 hour 58m 32s, 22. Jönsson/Sundberg (Porsche 924) 1 hour 59m 15s, 23. Kottulinsky/Sterner (Volvo 240 T) 1 hour 59m 39s, 24. Suld/Gustafsson (Volvo 240 T) 1 hour 59m 57s, 25. Steffansson/Hakala (Volvo 240 T) 2 hours 00m 06s, 26. Lovell/Davis (Ford RS 1600) 2 hours 00m 33s, 27. Blomqvist/Parmander (VW Golf GTi) 2 hours 00m 48s, 28. Lundqvist/Airtlund (VW Golf GTi) 2 hours 01m 00s, 29. Morin/-Lindström (Opel Ascona) 2 hours 02m 13s, 30. Sandin/Nordin (VW Golf GTi) 2 hours 02m 18s.

**SS 11: HOEDETANGEN (6.56 km)**
**Salonen 3m 29s (113 kph)**, Vatanen 3m 30s, Blomqvist 3m 31s, Röhrl 3m 32s, Mikkola 3m 37s, Eklund 3m 43s, Wilson 3m 48s, **Petterson 3m 50s**, Carlsson 3m 51s, Ericsson 3m 52s, Jonsson 3m 56s, Torph 3m 57s, Björn Blomqvist and Kressner 3m 58s, Eriksson, Ahlin, Gert Blomqvist and Fredriksson 3m 59s.
**SS 12: GODASEN**
**Vatanen 22m 37s (116 kph)**, Blomqvist and Salonen 22m 43s, Mikkola 23m 39s, Eklund 24m 05s, **Pettersson 24m 09s**, Ericsson 24m 12s, Wilson 24m 24s, Carlsson 24m 40s, Eriksson 25m 08s, Torph 25m 11s, Kressner 25m 13s, Ahlin 25m 16s, Johansson 25m 20s.
**SS 13: GUSTAVSFORS (3.33 km)**
**Blomqvist 3m 1s (105 kph)**, Röhrl 3m 2s, Salonen 3m 2s, Vatanen 3m 3s, Mikkola 3m 5s, Eklund 3m 13s, Wilson 3m 14s, **Ericsson 3m 18s**, Walfridson 3m 19s, Jonnson 3m 20s, Pettersson 3m 20s, Carlsson 3m 23s, Eriksson 3m 23s, Torph 3m 24s, Kressner 3m 25s, Johansson 3m 26s, Ahlin 3m 26s.
**SS 14: MUSSOHEDEN (29.89 km)**
**Blomqvist 16m 9s (111 kph)**, Röhrl 16m 14s, Mikkola 16m 30s, Vatanen 16m 43s, Eklund 16m 44s, Salonen 16m 47s, **Pettersson 17m**, Ericsson 17m 9s, Carlsson 17m 16s, Eriksson 17m 32s, Wilson 17m 34s, Blomqvist 17m 37s, Walfridson 17m 38s, Torph 17m 39s, Ahlin 17m 40s, Johansson 17m 41s.
**SS 15: LOVASEN (27.33 km)**
**Vatanen 14m 12s (115 kph)**, Blomqvist 14m 26s, Salonen 14m 27s, Röhrl 14m 36s, Mikkola 14m 44s, Eklund 15m 7s, **Pettersson 15m 17s**, Wilson 15m 29s, Ericsson 15m 32s, Eriksson 15m 36s, Carlsson 15m 40s, Torph 15m 46s, Jonsson 15m 49s, Johansson 15m 54s, Ahlin 15m 54s, Walfridson 15m 57s.
**SS 16: VASSJON (3.4 km)**
**Salonen 4m 39s (73 kph)**, Vatanen 4m 40s, Blomqvist 4m 42s, Röhrl 4m 47s, Eklund 4m 51s, Mikkola 4m 53s, **Pettersson 4m 54s**, Ericsson 4m 59s, Wilson 5m 3s, Eriksson 5m 5s, Gundler 5m 9s, Blomqvist 5m 11s, Jonsson 5m 13s, Suld 5m 13s, Sandin 5m 14s, Ottosson 5m 16s, Johansson 5m 18s.
**SS 17: OREDSSON (16.65 km)**
**Blomqvist 9m 43s (98 kph)**, Vatanen 9m 47s, Salonen 9m 51s, Mikkola 9m 58s, Röhrl 10m 1s, **Ericsson 10m 14s**, Eklund 10m 17s, Pettersson 10m 18s, Wilson 10m 21s, Jonsson 10m 25s, Carlsson 10m 35s, Torph 10m 38s, Johansson 10m 38s, Ahlin 10m 39s, Blomwvist 10m 46s, Blomqvist 10m 50s, Waldfridson 10m 52s.
**SS 18: BOGEN (14.41 km)**
**Vatanen 8m 32s (101 kph)**, Blomqvist 8m 37s, Salonen 8m 38s, Röhrl 8m 46s, Mikkola 8m 48s, Eklund 8m 57s, **Pettersson 9m 05s**, Ericsson 9m 12s, Jonsson 9m 19s, Carlsson 9m 26s, Walfridson 9m 26s, Ahlin 9m 26s, Torph 9m 30s, Eriksson 9m 32s, Blomqvist 9m 35s, Johansson 9m 40s, Gundler 9m 42s.
**SS 19: MÅNGEN (22.11 km)**
**Vatanen 13m 24s (98 kph)**, Blomqvist 13m 34s, Salonen 13m 38s, Röhrl 13m 41s, Eklund 14m 15s, **Pettersson 14m 24s**, Carlsson 14m 26s, Ericsson 14m 26s, Jonsson 14m 37s, Torph 14m 49s, Mikkola 14m 51s, Eriksson 14m 57s, Walfridson 15m 1s, Ahlin 15m 2s, Johansson 15m 14s, Gundler 15m 16s.
**SS 20: FINNEBACK (17.19 km)**
**Vatanen 9m 48s (105 kph)**, Blomqvist 9m 57s, Salonen 9m 58s, Röhrl 10m 8s, Mikkola 10m 11s, Eklund 10m 22s, **Pettersson 10m 31s**, Ericsson 10m 35s, Jonsson 10m 46s, Torph 10m 51s, Carlsson 10m 56s, Ahlin 11 m, Eriksson 11m 3s, Walfridson 11m 4s, Blomqvist 11m 4s, Johansson 11m 7s.
**SS 21: STOMME (10.91 km)**
**Salonen 6m 7s (106 kph)**, Blomqvist 6m 14s, Vatanen 6m 16s, Mikkola 6m 28s, **Pettersson 6m 40s**, Eklund 6m 44s, Jonsson 6m 44s, Ericsson 6m 46s, Torph 6m 48s, Carlsson 6m 49s, Eriksson 6m 53s, Ahlin 6m 57s, Blomqvist 7m, Steffanssson 7m 1s, Walfridson 7m 2s, Johansson 7m 4s, Suld 7m 9s.
**SS 22: VARMSKOG (13.71 km)**
**Salonen 8m 47s (95 kph)**, Blomqvist 8m 51s, Vatanen 8m 52s, Mikkola 9m 16s, **Ericsson 9m 20s**, Eklund 9m 21s, Petersson 9m 22s, Jonsson 9m 40s, Torph 9m 41s, Carlsson 9m 44s, Eriksson 9m 46s.
Ahlin 9m 51s, Johansson 9m 52s, Blomqvist 9m 53s, Blomqvist 9m 59s, Gundler 10m, Walfridson 10m 2s.

**STANDING AT THE END OF THE SECOND LEG**
**1. Vatanen 3 hours 41m 34s (at an average speed of 96 kph)**, 2. Blomqvist 3 hours 42m 53s, 3. Salonen 3 hours 44m 07s, 4. Mikkola 3 hours 49m 51s, 5. Eklund 3 hours 55m 39s, **6. Pettersson 4 hours 00m 25s**, 7. Ericsson 4 hours 00m 26s, 8. Carlsson 4 hours 04m 57s, 9. Jonsson 4 hours 06m 31s, 10. Torph 4 hours 07m 15s, 11. Eriksson 4 hours 07m 35s, 12. Johansson 4 hours 09m 11s, 13. Ahlin 4 hours 09m 47s, 14. Walfridson 4 hours 12m 18s, 15. Blomqvist 4 hours 15m 22s, 16. Blomqvist 4 hours 15m 36s, 17. Gundler 4 hours 15m 57s, 18. Suld 4 hours 17m 37s, 19. Jönsson 4 hours 18m 26s, 20. Kottulinsky 4 hours 19m 12s, 21. Ottoson 4 hours 19m 26s, 22 Steffenson 4 hours 20m 42s, 23. Sandin 4 hours 24m 21s, 24. Lundqvist 4 hours 29m 38s, 25. Rädstrom 4 hours 35m 20s, 26. Loveil 4 hours 36m 32s, 27. Ewertson 4 hours 41m 49s, 28. Hedström 4 hours 43m 00s, 29. Jackson 4 hours 46m 23s, 30. Alriksson 4 hours 46m 47s.

**SS 23: M.A. (9.44 km)**
**Vatanen 5m 15s (108 kph)**, Blomqvist 5m 21s, Mikkola 5m 30s, Eklund 5m 40s, **Ericsson 5m 45s**, Pettersson 5m 46s, Jonsson 5m 52s, Eriksson 5m 56s, Carlsson 5m 57s, Torph 6m 1s, Johansson 6m 2s, Walfridson 6m 3s, Ahlin 6m 3s, Blomqvist 6m 4s, Gundler 6m 10s.
**SS 24: GRINDSBYN (9.40 km)**
**Blomqvist 4m 43s (120 kph)**, Vatanen 4m 46s, Salonen 4m 55s, Mikkola 4m 59s, Eklund 5m 3s, Jonsson 5m 6s, **Pettersson 5m 6s**, Johansson 5m 12s, Eriksson 5m 12s, Ericsson 5m 13s, Carlsson 5m 19s, Walfridson 5m 19s, Ahlin 5m 19s, Steffansson 5m 20s, Torph 5m 21s, Blomqvist 5m 24s, Blomqvist 5m 25s.
**SS 25: HALONBIN (41 km)**
**Vatanen 25m 36s (110 kph)**, Blomqvist 26m 9s, Salonen 26m 12s, Eklund 27m 2s, **Pettersson 27m 43s**, Ericsson 27m 45s, Mikkola 27m 52s, Eriksson 28m 12s, Jonsson 28m 22s, Johansson 28m 23s, Carlsson 28m 27s, Ahlin 28m 3s, Walfridson 28m 59s, Gundler 29m 17s, Suld 29m 31s.
**SS 26: (14.34 km)**
**Vatanen 7m 49s (111 kph)**, Salonen 7m 55s, Blomqvist 7m 56s, Eklund 8m 15s, **Steffansson 8m 15s**, Mikkola 8m 16s, Pettersson 8m 25s, Jonsson 8m 31s, Eriksson 8m 31s, Carlsson 8m 38s, Torph 8m 39s, Walfridson 8m 39s, Blomqvist 8m 42s, Johansson 8m 43s, Ahlin 8m 48s, Suld 8m 48s, Blomqvist 8m 52s.
**SS 27: TOBYN (10.19 km)**
**Blomqvist 5m 27s (112 kph)**, Vatanen 5m 27s, Salonen 5m 35s, Mikkola 5m 38s, Eklund 5m 47s, **Petterson 5m 55s**, Jonsson 6m 00s, Torph 6m 07s, Carlsson 6m 08s, Johansson 6m 08s, Eriksson 6m 08s, Blomqvist 6m 09s, Ahlin 6m 11s, Gundler 6m 14s, Walfridson 6m 15s, Suld 6m 15s, Blomqvist 6m 16s.
**SS 28: VALASEN (8.99 km)**
**Blomqvist 6m 25s (84 kph)**, Salonen 6m 25s, Vatanen 6m 36s, Eklund 6m 37s, Mikkola 6m 39s, Jonsson 6m 49s, **Ericsson 6m 49s**, Pettersson 6m 52s, Eriksson 6m 54s, Torph 7m 01s, Suld 7m 04s, Gundler 7m 05s, Blomqvist 7m 07s, Carlsson 7m 08s, Johansson 7m 08s, Walfridson 7m 08s.
**SS 29: MARIEBERSSKOGEN (1.70 km)**
**Blomqvist 1m 45s (61 kph)**, Salonen 1m 45s, Vatanen 1m 46s, Mikkola 1m 47s, Eklund 1m 47s, **Pettersson 1m 51s**, Ericsson 1m 53s, Gundler 1m 53s, Eriksson 1m 54s, Walfridson 1m 55s, Blomqvist 1m 55s, Jönsson 1m 56s, Steffansson 1m 56s, Blomqvist 1m 56s, Ahlin 1m 58s, Radström 1m 59s.





### TECHNICAL DATA

**35th edition of the Swedish Rally.**
**Date:** 15th-17th February, 1985.
1st round of the World Rally Championship for constructors.
2nd round of the World Rally Championship for drivers.
**Start and Finish :** Karstad (Sweden).
**Rally Length:** 1,614.9 km/1,009.3 miles made up of 19 special stages covering a total of 513.8 km/321.1 miles.
**Three legs** all starting and finishing at Karlstad (or Alster, 5 km/3.1 miles away).
**1st leg:** Friday, 15th February, from 10:00 - 23:00: Karlstad - Malung - Alster: 500.8 km/313 miles. Ten special stages covering a total of 193.2 km/120.7 miles.
**2nd leg:** Saturday, 16th February, from 07:00 - 21:30. Alster - Torsby - Alster: 672.8 km/420.5 miles. Twelve special stages covering a total of 216.6 km/135.3 miles.
**3rd leg:** Sunday, 17th February, from 02:00 - 10:30: Alster - Arvika - Karlstad: 369.4 km/230.8 miles. Seven special stages covering a total of 104 km/65 miles.
**Entries:** 148; **Starters:** 115; **Finishers:** 57; **Classified:** 56.
**Driving Conditions:** Very cold and dry apart from a few snow showers on Saturday morning. Snow on some parts of the Rally. Numerous gravel areas on the stages.

### FOR THE RECORD

Mixed driving conditions on nearly all the stages (snow and gravel).
Fifth consecutive victory for Ari Vatanen/Terry Harryman and the Peugeot 205 Turbo 16.
No retirements for the Peugeot 205 Turbo 16 on any of the five rallies in which it has been entered.
Ari Vatanen is the second non-Swede after Hannu Mikkola (1981 and 1983 Rally winner), to win the Swedish.

### WORLD RALLY CHAMPIONSHIP (Constructors)

Results after two rounds (Monte Carlo and Sweden).

| | |
|---|---|
| 1. Peugeot | 18 + 18 = 36 |
| 2. Audi | 16 + 16 = 32 |
| 3. Lancia | 8 + — = 8 |
| 4. Renault | 6 + — = 6 |
| Mazda | — + 6 = 6 |
| 6. Citroën | 4 + — = 4 |
| Opel | — + 4 = 4. |

### WORLD RALLY CHAMPIONSHIP (Drivers)

Results after two rounds (Monte Carlo and Sweden).

| | |
|---|---|
| 1. **Ari Vatanen (SF)** | 20 + 20 = **40** |
| 2. Stig Blomqvist (S) | 10 + 15 = 25 |
| 3. Timo Salonen (SF) | 12 + 12 = 24 |
| 4. Walter Röhrl (D) | 15 + — = 15 |
| 5. Hannu Mikkola (SF) | — + 10 = 10 |
| 6. Bruno Saby (F) | 8 + — = 8 |
| Per Eklund (S) | — + 8 = 8 |
| 8. Henri Toivonen (SF) | 6 + — = 6 |
| 9. Gunnar Petterson (S) | — + 6 = 6 |
| 10. Dany Snobeck (F) | 4 + — = 4 |
| 11. Mikaël Ericsson (S) | — + 4 = 4 |

12. Jean-Claude Andruet (F) and Ingvar Carlsson (S) 3, 14. Massimo Biasion (I) and Mats Jonsson (S) 2, 16. Maurice Chomat (F) and Kenneth Eriksson (S) 1.
(17 classified drivers)

### FEATURES

**Rally:**
Average stage mileage made longer with the adding of a new 29.3 mile/47 km stage.
**Cars:**
First World Rally Championship round for the Group A Opel GSi.
**Drivers:**
First World Rally Championship round for Lars-Erik Torph in the works VW Golf GTi.

### MAIN RETIREMENTS

**Danielsson/Eklind** (Volvo 240 Turbo, SS 4: Fuel pump.
**Llewellin/Short** (Audi Quattro), SS 6: Off.
**Edling/Andersson** (Mazda 323 Turbo), SS 6: Off.
**Stromberg/Carlsson** (Opel Kadett GSI), SS 8: Off.
**Johansson/Ostensson** (Saab 99 Turbo), SS 10: Turbo.
**Lampi/Kuukkala** (Audi Quattro). Did not start second leg. Lost much time after an off.
**Wilson/Harris** (Audi Quattro), SS 18: Off.
**Röhrl/Geistdörfer** (Audi Sport Quattro), SS 21: Engine.

### SUCCESSIVE LEADERS

SS 1: Blomqvist and Vatanen
SS 2-29 (Finish): Vatanen

### PAST RESULTS

(Last ten years)
**1975 :** Waldegaard/Thorszelius (Lancia Stratos).
**1976 :** Eklund/Cederberg (Saab 99 V4).
**1977 :** Blomqvist/Sylvan (Saab 99 EMS)
**1978 :** Waldegaard/Thorszelius (Ford Escort 1800 RS).
**1979 :** Blomqvist/Cederberg (Saab 99 Turbo).
**1980 :** Küllang/Berglund (Opel Ascona 400).
**1981 :** Mikkola/Hertz (Audi Quaatro).
**1982 :** Blomqvist/Cederberg (Audi Quattro).
**1983 :** Mikkola/Hertz (Audi Quattro).
**1984 :** Blomqvist/Cederberg (Audi Quattro).

### BEST RESULTS

| | 1 | 2 | 3 | 4 | 5 | 6 | A | B |
|---|---|---|---|---|---|---|---|---|
| Vatanen | 16 | 7 | 4 | 2 | — | — | 29 | 29 |
| Blomqvist | 10 | 14 | 5 | — | — | — | 29 | 29 |
| Salonen | 7 | 6 | 14 | 1 | — | 1 | 29 | 29 |
| Röhrl | — | 2 | 1 | 13 | 4 | — | 20 | 20 |
| Mikkola | — | — | 2 | 9 | 14 | 2 | 27 | 29 |
| Eklund | — | — | — | 4 | 6 | 11 | 21 | 29 |
| Steffansson | — | — | — | 1 | — | — | 1 | 29 |
| Pettersson | — | — | — | — | 2 | 5 | 7 | 29 |
| Ericsson | — | — | — | — | 1 | 4 | 5 | 29 |
| Jonsson | — | — | — | — | — | 3 | 3 | 29 |

A : Number of placings in first six
B : Number of special stages covered.

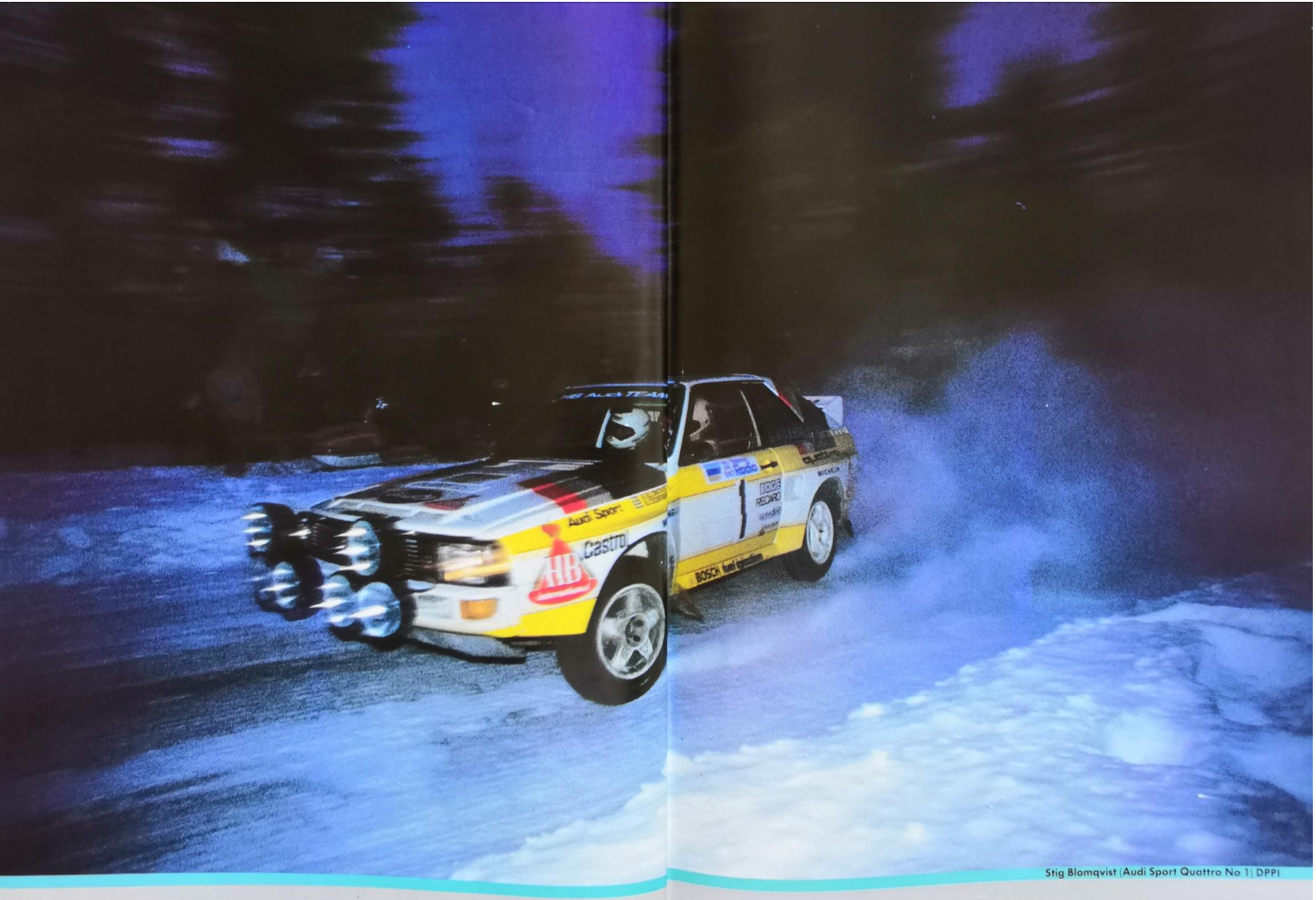
### FINAL RESULTS

| | | |
|---|---|---|
| 1. **Vatanen/Harryman** | **Peugeot 205 Turbo 16** | **4 hours 38m 49s (1st Group B).** |
| 2. Blomqvist/Cederberg | Audi Quattro Sport | 4 hours 40m 38s. |
| 3. Salonen/Harjanne | Peugeot 205 Turbo 16 | 4 hours 42m 15s. |
| 4. Mikkola/Hertz | Audi Sport Quattro | 4 hours 50m 32s. |
| 5. Eklund/Whittock | Audi Sport Quattro | 4 hours 55m 50s. |
| **6. Pettersen/Petterssen** | **Audi Sport Quattro** | **5 hours 02m 03s (1st Group A).** |
| 7. Ericsson/Johansson | Audi 80 Quattro | 5 hours 03m 16s |
| 8. Carlsson/Mellanger | Mazda RX 7 | 5 hours 08m 35s |
| 9. Jonsson/Gustavsson | Opel Ascona 400 | 5 hours 09m 07s |
| 10. Eriksson/Bo Thorszelius | Opel Kadett GSI | 5 hours 10m 22s |
| 11. Torph/Svanström | VW Golf GTi | 5 hours 10m 46s |
| 12. Johansson/Olsson | Opel Kadett GTE | 5 hours 12m 49s |
| 13. Ahlin/Lars/Karlsson | Opel Ascona | 5 hours 14m 05s |
| 14. LE Valfridsson/Bäckman | Renault 5 Turbo | 5 hours 16m 36s |
| 15. Gundler/Svanberg | Audi 80 Quattro | 5 hours 21m 15s |

16. Gert Blomqvist/Andersson (Opel Kadett GTE) 5 hours 21m 19s; 17. Björn Blomqvist/Parmander (VW Golf GTi) 5 hours 21m 24s; 18. Suid/Gustafsson (Audi 80 Quattro) 5 hours 23m 09s; 19. Jonsson/Sunberg (Porsche 924 Turbo GTS) 5 hours 25m 07s; 20. Steffansson/Hakala (Volvo 240 Turbo) 5 hours 25m 54s; **21. Kottulinsky/Sterner (2Volvo 240 Turbo) 5 hours 26m 07s (Ladies Trophy)**; 22. Lundqvist/Wennberg (Opel Ascona) 5 hours 40m 35s., 23. Radström/Simonsson (Toyota Starlet) 5 hours 54m 16s; 24. Lovell/Davis (Ford Escort RS 1600) 5 hours 45m 15s, 25. Ewerton/Holm (Opel Ascona) 5 hours 54m 16s; 26. Alriksson/Asp (Ford Escort RS 1800) 5 hours 58m 22s; 27. Jackson/Orrick (Opel Manta 400) 5 hours 58m 48s; 28. Sundqvist/Torpfeidt (Opel Ascona) 6 hours 02m 59s; 29. Bäckwall/Bäckwall (Saab 96 V4) 6 hours 05m 25s; 30. Aamodt/Solbergqster (VW Golf GTi) 6 hours 09m 45s (1st Group GTi); **31. Dusset/Faure (Talbot Samba Rally) 6 hours 11m 59s (2nd Group N)**; 33. Hauser/Gerard (Peugeot 205) 6 hours 13m 21s.

Ola Stromberg (Opel Kadett GSI No 13) DPPI

*TYPICAL CONDITIONS FOR THE SWEDISH BUT LACK OF SNOW ON CERTAIN SECTIONS HAD A ROLE TO PLAY*




Stig Blomqvist (Audi Sport Quattro No 1) DPPI

STIG BLOMQVIST TRIED HARD ALL THE WAY TO CLINCH HIS EIGHTH HOME WIN. BUT THERE WAS NO BEATING VATANEN

Blomqvist (Audi Quattro Sport) DPPI

**STIG BLOMQVIST SHOWED ULTRA-COMPETITIVE FORM. WATCH OUT PEUGEOT FOR AUDI'S CHALLENGE**

Audi service crew Autopresse

**WALTER ROHRL COULD HAVE PUT AN END TO THE PEUGEOT RE GN — IF THE GEARBOX HADN'T DECIDED OTHERWISE**

Moutinho (Renault 5 Turbo) DPPI

*LOCAL HERO MOUTINHO CAREERS HELTER SKELTER THROUGH A HUMAN TUNNEL*

RALLY OF PORTUGAL

# PEUGEOT RELAY

TIMO SALONEN WAS HAVING HIS ARM MUSCLES RUBBED BY THE PEUGEOT TEAM DOCTOR ON THE BACK SEAT OF THE SERVICE VAN. "*I MUST TAKE IT EASY THROUGH THESE LAST FOUR STAGES, REALLY EASY,*" HE MURMURED OVER AND OVER AGAIN TO HIMSELF.

by Michel Lizin

Twice already during his rallying career, Timo Salonen has seen victory disappear just when he thought it was in the bag. In Argentina, in 1981, the quiet Finn was forced to retire during the last but one stage whilst he was leading Guy Frequelin's Talbot Lotus by 11 minutes. Two years later, at the Safari, Timo had a gap of nearly two hours between himself and Ari Vatanen when his Nissan's engine blew just 120 miles from the finish. Victory was handed to his current team mate on a plate.

Fully aware that nothing's ever won until you've crossed the finish line, Timo was as prudent in his declarations as he was in his driving. This time, the ultimate reward was his.

A few hundred yards from there, tall Walter Röhrl was sitting on one of his Audi Quattro Sport wheels. Relaxed, smiling, talkative, the Bavarian didn't seem to be too unduly upset at having lost his first place, a first place that he must have thought safe just a few hours ago. Röhrl will never stop surprising us. The German driver more than merited victory. With 22 fastest times out of 47 stages, rally leader for more than half the event after having been second to Biasion at the beginning, Röhrl dominated the 19th Portugal Rally by his sheer class and talent.

*"Tough luck, Walter,"* ventured someone in an effort to console him but Walter didn't appear to need consoling. He seemed to be proud of the fact that he had done his best and prefered to tell us about his impressions of the rally and talk about his adventures.

*"In Arganil 2, the turbo boost was up from 1.7 to 2.0 bars. That meant a power output of 500 bhp! You really feel the power. The wheels spin even when you change up to fifth at over 100 mph. You know what? I'm going to ask if we can keep the boost at this level for the last four stages, for the pleasure and to see how long the engine will last."*

A pause and Walter admits, *"To think I've got to go out there now and battle to try and finish second."*

The evening before, at the end of the third and last-but-one leg of the rally, Walter Röhrl had been able to sleep peacefully. There remained only 100 miles of stages and he held a lead of 6m 22s over Timo Salonen, driver of the only Peugeot 205 Turbo 16 left in the rally.

Unfortunately for the German driver, he had yet to tackle Arganil.

## THE TURNING POINT

*"It's the best stage in the rally. Who said it was rough? With its long fast curves, Arganil's a super stage. You drop into a valley, climb back out, then undulate over the top of the hill before driving back down into the valley. You go through an incredible number of villages, each packed with wildly enthusiastic spectators. They're everywhere, on the roadside, waiting up all night for the rally, lighting wood fires to keep warm. On top of all that, the stage takes place just as the sun is rising and the valleys are slowly filled with sunlight as a faint mist rises up from the morning dew."*

These are the words of a French driver, one of the many foreign amateurs that look to take part in the truely beautiful European rallies. Walter Röhrl has got his own reasons for having a particular liking for the Arganil stage, the longest of the rally (35 miles) and the most famous. It was here that, in 1982, he won the Portugal, humiliating his Lancia team mate of the day, Markku Alen, in the fog. But for this year, a damaged differential on the first run through and a puncture on his all-or-nothing second attempt put paid to his chances of victory.

Then, on the penultimate stage, a further puncture put the Audi driver even out of the running for second. For the first time this year, the German manufacturer has been in a position to halt the Peugeot march. It's ironic when you think that Audi will actually score less points here than they did at Monte Carlo or in Sweden.

## IMPROVEMENTS

Audi have proven that they are still a force to be reckoned with (at least until the latest evolution of the 205 comes out) but the championship situation is even more unbalanced than it was before the start of the Portugal despite this performance.

Peugeot are now leading Audi by three to nil. The risk that the championship may lose its interest as a result is real. But you can't really blame Peugeot Talbot Sport. In sport, you can't be too good.

*"I'm in the lead because the Peugeot drivers decided not to play the game, prefering not to go all out on the tarmac stages. You wait. When we get onto the loose stages they'll fly ahead."*

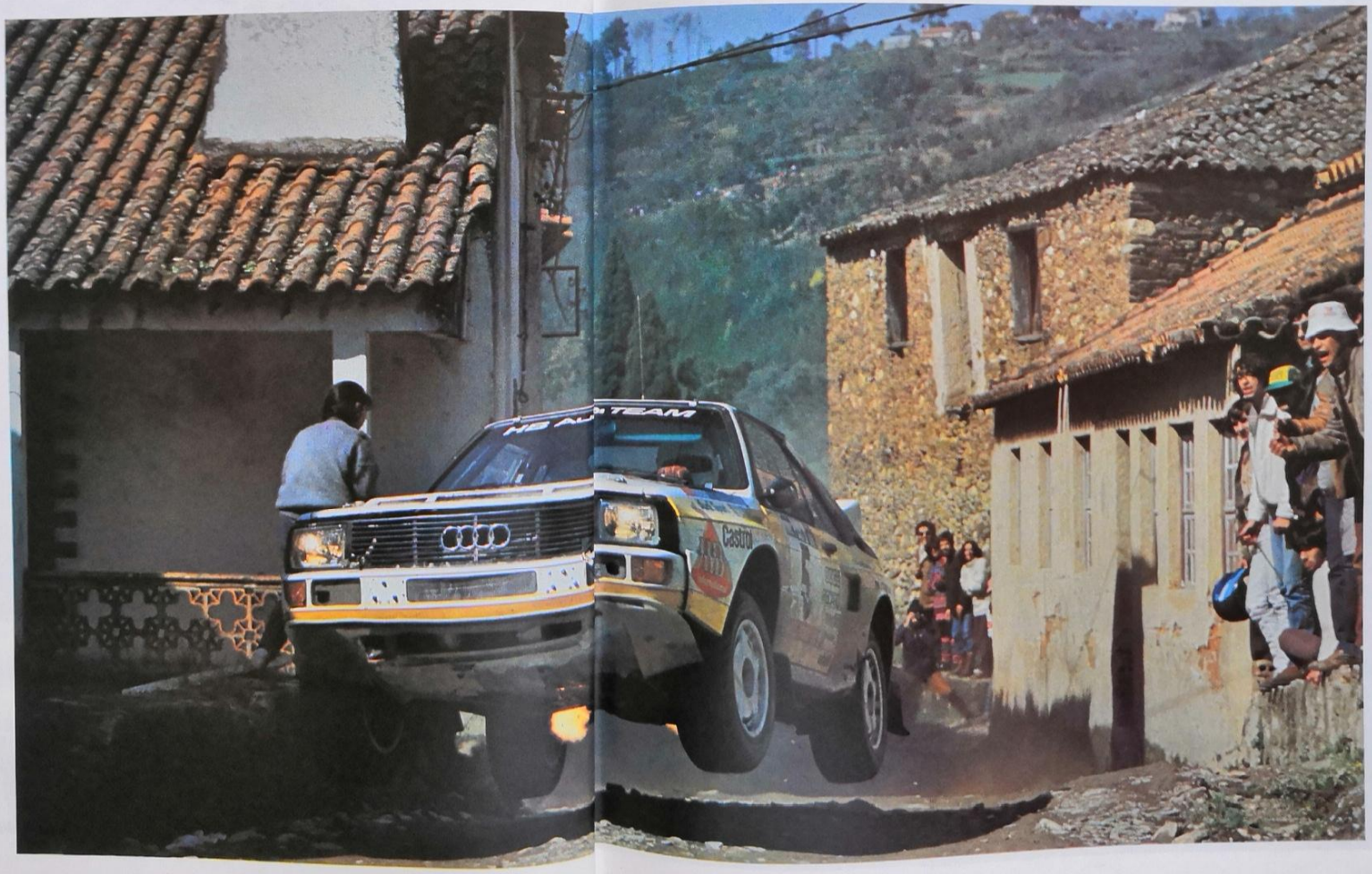
Walter Röhrl is never more dangerous than when he admits defeat beforehand. His statements are often inversely proportional to his intentions. It's not that he's being underhand. It's more a means of motivating himself, almost although the pretended 'throwing in the towel' can't have that much of an effect on his rivals. After more or less equalling the times of the Peugeots and

### Team by team

There were 94 crews at the start of the rally including 20 Citroën Visas taking part in a local Citroën trophy around the Sintra loops. None of these cars went further than stage nine. There were very few factory teams present. Peugeot were there, of course, and Audi. Volkswagen had made the trip over and there was a works Dacia, a Rumanian version of the Renault 12. The Jolly Club had entered a Lancia Rally 037 for Biasion/Siviera.

The two Audi Quattro Sports were entered for Blomqvist/Cederberg and Röhrl/-Geistdorfer and were both new. Both cars boasted 450 bhp with the power coming in at around 4000 rpm going up to a maximum of 8600 rpm. Salonen/Harjanne's Peugeot 205 Turbo 16 was new and Vatanen/Harryman were using the car that had already won the Monte Carlo and the Swedish. Both cars were set up 1/3 power to the front, 2/3 to the rear and remained so for both the tarmac and loose stages. Audi, Peugeot and the other top teams planned to change the suspension at the end of the first leg. In the Peugeot camp this was coupled with a gearbox change, the intermediary box making way for the closer ratio box.

The Portugal was the first rally of the year for the VW Motorsport team and two cars were available for Kleint/Hohenadel and Wittermann/Hinterleitner. The power of the Group A Golf GTi is still 170 bhp. Other noteworthy entries included the 300 bhp Renault 5 Turbo of Moutinho, Mendes's Nissan 240RS and an ex-works Audi Quattro for the Austrian skier, Werner Grissmann. There was a Group A Peugeot 205 GTi for Fischer, a Group A Toyota Corolla for Ortigao, a Group A Opel Manta for "Tchine" and a Citroën Visa 1000 Pistes for Dorche.




***Röhrl in excellent fighting spirits with his Audi Quattro Sport.***

## The Rally

The very fast nature of the first stage gave the Audis a chance to exploit their power to the full and Röhrl was the first rally leader ahead of Blomqvist. Then, just before the finish of stage 3, Röhrl, Blomqvist and Kleint all touched the same rock and punctured either one or two tyres. It was Biasion that inherited the lead and he held onto it until stage 8 when he too punctured. Stage 4 saw Salonen score his first fastest time in the Peugeot on tarmac. He tended to be more spectacular and faster than Vatanen during the early stages of the event. In the Sintra stage, Dorche managed 7th fastest with his Visa 1000 Pistes and was in 8th position overall in front of the two VWs and equal with Grissmann's Audi Quattro.

Up front, things remained very close with only Blomqvist losing a bit of ground. As soon as night fell (SS 10), he was further slowed with turbo problems which were to plague him for the rest of the rally despite continued attempts to change the offending parts. Towards the end of the first leg, Röhrl's Audi lost a bit of its power and Biasion found himself in the lead again. At the end of the tarmac stages he had a 58s-lead over Röhrl and 1m 11s over Vatanen who had at last managed to get the better of Salonen by 14s. Blomqvist was already 3m 51s behind followed by Moutinho and Grissmann. Wittmann led Group A at the beginning of the rally but his team mate, Kleint, had gone into the lead by the end of the first leg. Dorche had retired and there were 56 crews left in the rally.

Vatanen punctured on the first of the gravel stages and finished the stage on the wheel rim, losing 43s to Röhrl. It was possibly these few miles run on the rim that were responsible for his retirement three stages further on when the suspension collapsed. The Finn was able to continue at a snail's pace with the sump guard scraping along the ground. He managed to complete a further 4 or 5 miles but a sender from the electronic ignition broke and the engine died. Despite the prompt intervention of the Peugeot helicopter, nothing could be done and Vatanen had to retire. On the same stage (SS 21), Röhrl took back the lead but Salonen was only 26 seconds behind the German before being delayed by a puncture and by a broken wheel shaft. He finished the second leg 3m 55s behind a confident Röhrl. Biasion had been driving well and was in second position between the Audi and the Peugeot. Blomqvist had lost 4 minutes on a road section following gearbox and differential problems, as well as his persisting turbo troubles. He was still in fourth position but over 10m behind Röhrl. Moutinho had managed to get his Renault 5 Turbo into fifth place but the two works Golfs had both retired. Kleint went out with gearbox problems and Wittmann lost 22s when his gearbox, too, showed signs of wear before going OTL after experiencing injection problems. There were 38 cars left in the rally. The third leg included 12 stages and took the remaining crews from Povoa de Varzim to Viseu. Röhrl continued his impressive display while Salonen was more worried about finishing the rally in one piece. The Finn still managed to steadily take time off Biasion to take second place. Then, on a road section at low speed, Salonen's suspension collapsed. Fortunately, the Peugeot service crew was at hand to repair the damage. To check in at the following time control, Salonen had to put up a magnificent display of driving on open roads with gravel tyres and suspension. He just managed although the gap between him and Röhrl was 6m 22s by the end of the third leg, the German 8m 50s ahead of Biasion and 14m 02s in front of Blomqvist. Mountinho had retired his Renault following engine problems.

The fourth and last leg included the famous Arganil stage twice. The first time through, Röhrl lost 3m 43s with gearbox and differential problems. To repair the damage, Röhrl lost a further 5 minutes on the following road section and Salonen, through no fault of his own, was suddenly the new rally leader. Röhrl decided to gamble everything on the second time through Arganil but was extremely unlucky when his Audi punctured. On the same stage Salonen had broken a shock absorber and finished the stage with his tyres down to the canvas. Biasion finished Arganil 1 on three wheels after the wheel studs had sheered but Röhrl's problems let the Italian through into second place after Arganil 2. Everyone thought that Röhrl would have no trouble taking back the 20 seconds that separated him from the Lancia driver but another puncture on the Audi left the second place definitely for Biasion. Salonen won the rally with a final lead of 4m 47 over Biasion, 5m 58s over Röhrl, 23m 46s (!) over Blomqvist and 1h 05m 55s (!!) over Grissmann. The young Jose Miguel finished best-placed local driver with his Group B Ford Escort while Group A honours went to the Toyota Corolla of Ortigao and Group N winner was the German, Ewald Klein, and his Peugeot 205 GTi after the retirement of Breyner's Audi 80 following shock absorber problems. Audi were decidedly out of luck.

## Brotherly love

Jose Miguel finished the rally 6th overall and best local driver. His Group B Ford Escort RS1800 was entered by Rodamsport.

Pedro Leite Faria finished 10th overall and second Group A with his Ford Escort RS2000 also entered by Rodamsport.

Jose Miguel and Pedro Leite Faria are brothers. Jose Miguel's full name is Jose Miguel Leite Faria. For rallying purposes he only uses his first names to avoid confusion. He works for his father whose name is... Rodam and who is the Porto Ford dealer.

Jose Miguel is 23 and started rallying two years ago at the wheel of a Group 2 Escort RS1800. In 1983, he won the Portuguese beginners championship. The winner in 1984 was none other than his 21-year old brother. Already in 1984, Jose Miguel had the Escort RS1800 with which he was constantly in battle with Carlos Bica, the two drivers being the main elements of the national championship behind Joaquim Moutinho and Joaquim Santos. Jose Miguel will be out to do even better this year whilst his younger brother will compete in only a few events with his Group A car, preferring to concentrate on his Formula Ford activities.

*"Micky" gave a memorable demonstration of his talents.*

## It happened in Portugal

... And it could only happen in Portugal. The rally was delayed on two occasions, SS 4 and SS 42. On the fourth stage, a young spectator had been watching the rally from the top of an embankment, perched on his motorbike. He must have lost his balance and the bike started to slide down the bank to end up on the stage itself just as a Citroën Visa was passing. Fortunately the spectator only hit the rear end of the car but the stage was stopped as an ambulance came to take away the young man. Was he seriously hurt?

*"That's his problem,"* came the rather heartless reply of a local journalist.

Stage 42 (Louisa 1) was also delayed when an ambulance was sent to pick up a woman spectator who had begun to give birth as rally cars hurtled past.

## A friend in need

Shortly after the finish of SS 45 (Louisa 2), just two stages from the end of the rally, Massimo Biasion noticed that the rear end of his Lancia was about to give way. The Italian driver only had a light service vehicule available and he was obliged to stop at the Peugeot service crew where the French team allowed him to use their welding gear. The welding was carried out by one of Carlo Bica's mechanics.

## The Sintra Rally

For the locals of Porto, the only part of the rally that really counts is the Sintra loop. *"That's where you've got to prove that you're more spectacular and faster than your neighbour,"* explained the Italian driver, Tchine, who was using the services of a local co-driver. The co-driver in question couldn't have been happier as Tchine spun on each of the three runs through Sintra.

Local hero, Carlos Bica (27 years old), went one better (or worse). He left the road violently on the first time through only to give a repeat performance on the second run. Following these two 'offs', the car was restored to its basic original shape thanks to a number of well-placed hammer blows and Bica happily got on with the job of finishing the rally. This he managed, taking 7th place, just behind his traditional rival, Jose Miguel.

But it hadn't been as easy as all that. Bica was nearly excluded at the start of the second leg as his car refused to start and the crew were unable to push start because the front wheels were too splayed out. The wide racing tyres that were fitted did not help matters. In such circumstances, the crew is not allowed to receive outside help so Bica got behind the steering wheel and co-driver Sena pushed... But he, in turn, was pushed by a dozen or so fellow drivers who, technically, did not come in contact with the car. Sena, however, thought he was going to be squashed to death in the effort.

## Is anybody awake?

When asked to explain his relatively poor time on SS 8 (Peninha 3) when he was beaten by team mate Ari Vatanen by 7 seconds, Timo Salonen replied, *"I fell asleep at the wheel."*

On the other hand, Vatanen had improved his time over Peninha 2 by 8 seconds. When asked why there was such a difference, he answered, *"I managed to wake up for a moment... but I fell straight back to sleep as soon as it was over."*

The two drivers were quizzed separately and had not conferred.

## Bogged down

Massimo Biasion had begun recce for the Portugal very early, even before his victory at the Costa Brava Rally. During that period, rain hardly stopped falling and Biasion found himself bogged down in the middle of the Carvalho de Rei stage. Works drivers are well backed up nowadays on recce so the Italian driver called up his service crew for help... They got bogged down two miles from where Biasion was stranded. The unlucky group met up and went together to a nearby village to get help and the owner of a Toyota Landcruiser offered his services. He got bogged down too. It needed a tractor, half the local population and many hours of puffing and panting before the various vehicules could be freed from the mud.

## Ups and downs

After his vain attempt to get his Peugeot to the end of stage 21, Ari Vatanen was forced to park up at the spot that his motor had decided to give up the ghost. It turned out to be a very difficult place for the Peugeot helicopter to land and the pilot had to land half on the stage itself. As the mechanics tried hard to repair the Finn's car, the helicopter would take off and land again each time a rally car passed.

## The menu

The Portugal has tended to keep to the same format during recent years and this, the 19th running of the event, was no exception. With the start and finish at Estoril, near Lisbon, the rally was comprised of four sections. The first leg totalled 185 km of stages and was run entirely on asphalt whereas the remaining three legs were over 100 % loose stages with a total distance of 545 km, a tarmac/gravel ratio of 3 to 1. The gravel stages have, in fact, degraded over the years and this year they were in a worse state than ever after a particularly hard and rainy winter. Ari Vatanen described them as the toughest in the whole of the World Rally Championship. The total length of the rally was 2,455 km.

***Jose Miguel swings his Ford round past the spectators.***

***Rather worse for wear but still fighting, Carlos Bica.***

the Lancia on the tarmac stages, Röhrl stamped his authority on the rally as soon as they moved into the gravel stages. The Audis were fastest on 27 of the 47 stages, 5 thanks to Blomqvist and 22 thanks to Röhrl. You could be forgiven for thinking that the Audi domination of Peugeot was due to the German driver rather than the car itself.

*"I don't agree,"* maintains Walter. *"OK. The handling of the Audi Quattro Sport is no better but the engine has improved no end. Maximum revs are now at 8600 rpm instead of 8000 rpm and the power's there at about 4000 or 4500 rpm. That means you've got a useful rev range in the order of 4000 rpm."*

Nearly as much as the Peugeot... and, thankfully, the drivers have at last got time to change gear before the rev limiter cuts in.

## SOME FIGURES

Twenty seven fastest stage times for the Audis against 12 for the only Lancia in the rally and only 11 for the two Peugeots. Interesting, but these figures hide a part of the truth. Peugeot did not win only because luck was on their side.

Apart from the fact that the Peugeot team was quickly reduced to one car, Timo Salonen was extremely prudent as the rally moved into the gravel stages in an attempt to get used to the car in these conditions. His confidence was quick in coming and he took fastest times on each of the two early long stages beating the German by 8 and 16 seconds respectively. Timo was only 26s behind the Audi driver when Vatanen retired and Jean Todt, the PTS team manager, made it clear to the Finn that second place would be a good result for Peugeot here in Portugal as far as the World Championship was concerned.

Röhrl's problems meant that Salonen won but who could say how the Peugeot driver would have compared if he had been given the freedom to attack Röhrl as best he could?

There's no point in rewriting rallies with 'ifs' but it shouldn't be forgotten either that Timo Salonen had, in fact, also been a victim to mechanical problems in the form of a puncture and a broken wheel shaft. For the first time this season we have seen that the Peugeots are not immune to technical problems. Vatanen went out after four gravel stages following a collapsed suspension and Salonen suffered a similar problem although, fortunately for him, it was on a road section at low speed.

*"The shock absorbers tended to overheat. We changed them fourteen times on Timo's car,"* explained André de Cortanze. *"Once they cooled down we could use them again. Out of precaution we changed the transmission every 60 miles or so and we changed the suspension knuckles regularly."*

The Peugeot mechanics had every chance to prove their legendary efficiency in Portugal. Their car won, but many were surprised by the number of, albeit small, problems experienced on the Peugeot 205 Turbo 16. The problems remain relatively minor especially when you compare them with Audi's troubles; Peugeot's problems are suspension knuckles and shock absorbers. The Audi's have to cope with things like the gearbox, turbo, differential etc. Although Röhrl's big troubles came towards the end of the event, he had been plagued throughout by gear selection difficulties due to the excessive working temperature of the gearbox.

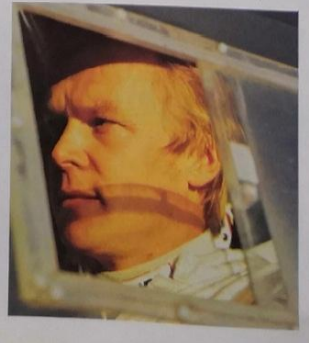
## REGRETS?

Also, as far as the understanding of on-the-spot rally problems are concerned. Jean Todt tends to have the edge. One example clearly show this. The second run through Arganil was obviously going to have an important bearing on the final result. It was here that Salonen and Röhrl were probably going to sort it out once and for all. Walter Röhrl, in fact, lost any chances he may have had when he punctured, losing 4 minutes. The time lost could have been reduced but the Audi helicopter, with Roland Gumpert and an Audi mechanic on board, were not following the German driver's car. When Röhrl punctured, they were busy trying to sort out Blomqvist's turbo problems, his Audi being immobilised on the same stage.

At that point in the rally, Blomqvist was lying fourth overall with a lead of over 40 minutes over fifth-placed Grissmann in another Audi. As far as the championship is concerned, it would have been a better idea to make sure that Röhrl complete the stage without worrying about Blomqvist. In any case, Grissmann would have been there to pick up the points if the worst had come to the worst. It was probably here in Arganil 2,

***The turning point of the Rally — the rear wheel gives way on Vatanen's Peugeot forcing the Finn into retirement.***

and not the penultimate stage of the rally, where Röhrl lost his second place. Once again, Massimo Biasion has proved that he has got what is needed to become one of the world's top drivers. The progress he has made in the space of one year is clear. He knows the Lancia Rally perfectly now and that can be seen by the way he goes into bends. His style is a lot more frank compared with last year and he is still improving. The Lancia has again proved that it can be a very reliable car and Alen and Toivonen must regret a little that they had been confined to the role of testing in Italy while they could have been in with a real chance of victory out there in Portugal. ■



## RESULTS

**SS 1: LAGOA AZUL-1 (5 km)**
**Röhrl 2m 13s (1st Group B);** Blomqvist 2m 16s; Salonen 2m18s; Biasion 2m 19s; Vatanen 2m 20s; Moutinho 2m 27; Grissmann 2m 30s; Carlos Bica 2m 35s; Miguel 2m 37s; **Wittmann 2m 40s (1st Group A);** Dorche 2m 40s; Fischer 2m 42s; Saint-Mendez 2m 43s; Ortigão 2m 43s; Kleint 2m 45s; Rui Souto 2m 45s; Santos 2m 47s; Fernandez 2m 47s; Silva 2m 49s; Fontes 2m 51s; Breyner 2m 51s, "Tchine" 4m34s.

**SS 2: PENINHA-1 (6.5 km)**
**Biasion 3m 42s;** Vatanen 3m 43s; Röhrl 3m 43s; Salonen 3m 44s; Blomqvist 3m 48s; Moutinho 3m 53s; Carlos Bica 4m 6s; Miguel 4m 8s; Dorche 4m 11s; Grissmann 4m 15s; **Wittmann 4m 17s;** Ortigão 4m 21s; Kleint 4m 22s; Santos 4m 22s; Fischer 4m 22s; Mendes 4m 23s; Souto 4m 26s; Fernandez 4m 26s; Fontes 4m 27s; Silva 4m 30s; "Tchine" 8m 20s.

**SS 3: SINTRA-1 (10.5 km)**
**Biasion 6m 45s;** 2.Salonen 6m 52s; Röhrl 6m 53s; Vatanen 6m 56s; Blomqvist 7m 1s; Moutinho 7m 9s; Dorche 7m 35s; Grissmann 7m 36s; Miguel 7m 45s; Wittmann 7m 45s; **Wittmann 7m 48s;** Kleint 7m 49s; Fischer 7m 49s; Santos 7m 54s; Mendes 7m 56s; Souto 7m 56s; Silva 7m 57s; Ortigão 7m 58s; Fontes 8m 2s; Fernandes 8m 6s; "Tchine" 8m 20s.

**SS 4: LAGOA AZUL-2 (5 km)**
**Salonen 2m 13s; Blomqvist 2m 14s; Biasion 2m 15s; Röhrl 2m 15s; Vatanen 2m 16s; Moutinho 2m 23s; Grissmann 2m 26s; Miguel 2m 33s;** Bica **2m 35s; Wittmann 2m 36s;** Dorche 2m 36s; Fernandes 2m 39s; Fischer 2m 40s; Mendes 2m41s; Souto 2m 41s; Ortigão 2m 41s; Kleint 2m 42s; Silva 2m 46s; "Tchine" 2m 47s.

**SS 5: PENINHA-2 (6.5 km)**
**Biasion 3m 43s;** Röhrl 3m 43s; Salonen 3m 43s; Vatanen 3m 44s; Moutinho 3m 46s; Blomqvist 3m 49s; Miguel 4m 5s; Carlos Bica 4m 7s; Grissmann 4m 9s; Dorche 4m 9s; **Wittmann 4m 13s;** Mendes 4m 19s; Kleint 4m 21s; Fischer 4m 21s; Fernandes 4m 21s; Ortigão 4m 22s; Souto 4m 25s; Fontes 4m 27s; Silva 4m 28s; "Tchine" 4m 29s; Santos 4m 32s; Breyner 4m 36s; Meylan 4m 37s; Garvik 4m 46s.

**SS 6: SINTRA-2 (10.5 km)**
**Biasion 6m 40s;** Röhrl 6m 41s; Salonen 6m 48s; Vatanen 6m 49s; Blomqvist 6m 53s; Moutinho 6m 56s; Dorche 7m 20s; **Wittmann 7m 27s;** Grissmann 7m 28s; Miguel 7m 29s; Kleint 7m 37s; Bica 7m 40s; Fischer 7m42s; Silva 7m 46s; Santa 7m 50s; Fontes 7m 52s; Souto 7m 52s; Mendes 7m 54s; Fernandes 7m 55s; Ortigão 7m 56s; "Tchine" 8m 1s; Breyner 8m 5s.

**SS 7: AGOA AZUL-3 (5 km)**
**Röhrl 2m 11s;** Blomqvist 2m 12s; Salonen 2m 13s; Vatanen 2m 14s; Biasion 2m 15s; Moutinho 2m 22s; Grissmann 2m 26s; Bica 2m 33s; Miguel 2m 33s; **Kleint 2m 34s;** Wittmann 2m 34s; Dorche 2m 37s; Fischer 2m 38s; Fernandes 2m 39s; Mendes 2m 40s; Souto 2m 40s; Ortigaö 2m 42s; Santos 2m 43s; "Tchine" 2m 46s.

**SS 8: PENINHA-2 (6.5 km)**
**Vatanen 3m 36s;** Röhrl 3m 38s; Salonen 3m 43s; Buausib 3m 44s; Moutinho 3m 45s; Blomqvist 3m 46s; Bica 4m 2s; Miguel 4m 3s; Grissmann 4m 6s; Dorche 4m 6s; **Kleint 4m 9s;** Wittmann 4m 10s; Fischer 4m 16s; Mendes 4m 18s; Ortigäo 4m 21s; Fernandes 4m 21s; Souto 4m 22s; Breyner 4m 22s; Larama 4m 22s.

**SS 9: SINTRA-3 (10.5 km)**
**Biasion 6m 39s;** Röhrl 6m39s; Salonen 6m42s; Vatanen 6m45s; Blomqvist 6m50s; Moutinho 6m 53s; Dorche 7m20s; Grissmann 7m21s; **Kleint 7m 24s;** Wittmann 7m 25s; Bica 7m 30s; Miguel 7m 31s; Fischer 7m 37s; Silva 7m 44s; Santos 7m 47s; Souto 7m 47s; Mendes 7m 49s; Fernandes 7m 50s; Fontes 7m 51s.

**SS 10: GRADIL (6.5 km)**
**Biasion 3m 28s;** Röhrl 3m 32s; Vatanen 3m 35s; Salonen 3m 35s; Blomqvist 3m 38s; Moutinho 3m 47s; **Kleint 4m 0s;** Miguel 4m 1s; Wittmann 4m 5s; Grissmann 4m 6s; Bica 4m 12s; Santos 4m 15s; Fernandes 4m 16s; Fischer 4m 17s; Dorche 4m 18s; Ortigäo 4m 19s; Faria 4m 19s; Cunha 4m 22s; Rizzi 4m 24s.

**SS 11: MONTEJUNTO (13 km)**
**Röhrl 6m 18s;** Biasion 6m 20s; Vatanen 6m 21s; Blomqvist 6m 25s; Salonen 6m 30s; Moutinho 7m 0s; **Kleint 7m 17s;** Wittmann 7m 28s; Miguel 7m 32s; Grissmann 7m 36s; Bica 7m 48s; Fischer 7m 52s; Ortigäo 7m 55s; Santos 7m 58s; Mendes 8m 1s; Souto 8m 7s; Fernandes 8m 8s; Meylan 8m 22s; Cunha 8m 28s; "Tchine" 8m 34s.

**SS 12: FIGUEIRO DOS VINHOS (20.5 km)**
**Biasion 12m 49s;** Röhrl 12m 55s; Vatanen 13m 0s; Salonen 13m 4s; Blomqvist 13m 35s; Moutinho 13m 51s; Grissmann 14m 37s; Miguel 14m 47s; **Wittmann 14m 50s;** Kleint 15m 1s; Carlos Bica 15m 21s; Dorche 15m 35s; Mendes 15m 36s; Fischer 15m 38s; Souto 15m 57s; Ortigäo 15m 57s; Fernandes 15m 58s; M. Meylan 16m 8s; Rizzi 16m 16s; Leite Faria 16m 24s.



**SS 13: CAMPELO (10.5 km)**
**Biasian 7m 3s;** Salonen 7m 11s; Vatanen 7m 13s; Röhrl 7m 15s; Blomqvist 7m 23s; Moutinho 7m 33s; **Kleint 7m 52s;** Grissmann 7m 57s; Wittmann 8m 6s; Miguel 8m 6s; Bica 8m 12s; Dorche 8m 28s; Mendes 8m 29s; Souto 8m 31s; Fischer 8m 32s; Santos 8m 33s; Ortigäo 8m 34s; Fernandes 8m 36s; Faria 8m 41s; Meylan 8m 44s.

**SS 14: SERRA DE LOUSA (25 km)**
**Biasion 14m 46s;** Salonen 15m 6s; Vatanen 15m 9s; Röhrl 15m 15s; Blomqvist 15m 39s; Moutinho 16m 2s; **Kleint 16m 38s;** Grissmann 17m 1s; Wittmann 17m 11s; Miguel 17m 18s; Santos 17m 43s; Dorche 17m 44s; Bica 17m 47s; Souto 18m 7s; Ortigäo 18m 7s; Fernandes 18m 7s; Fischer 18m 8s; Mendes 18m 17s; Rizzi 18m 32s.

**SS 15: PRESTIMO (12.5 km)**
**Biasion 7m 28s;** Vatanen 7m 31s; Salonen 7m 33s; Röhrl 7m 41s; Blomqvist 7m 51s; Moutinho 8m 24s; **Kleint 8m 35s;** Grissmann 8m 35s; Miguel 8m 37s; Bica 8m 47s; Wittmann 8m 49s; Souto 9m 8s; "Tchine" 9m 41s; Ortigäo 9m 15s; Fischer 9m 24s; Mendes 9m 25s; Faria 9m 27s; Meylan 9m 40s.

**SS 16: VOUZELA (23 km)**
**Vatanen 14m 55s;** Röhrl 15m 0s; Biasion 15m 2s; Salonen 15m 6s; Blomqvist 15m 20s; Moutinho 16m 40s; **Kleint 16m 58s;** Grissmann 17m 29s; Bica 17m 33s; Miguel 17m 39s; Wittmann 17m 41s; Mendes 17m 46s; Fischer 18m 14s; Ortigäo 18m 41s; Leite 19m 1s; Souto 19m 6s; Breyner 19m 14s; Cunha 19m 22s; Segurado 19m 29s; Garvik 19m 34s.

**SS 17: OLIVEIRA DE FRADES (8.5 km)**
**Biasion 4m 36s;** Vatanen 4m 38s; Salonen 4m 38s; Ro-hrl 4m 40s; Blomqvist 4m 45s; Moutinho 4m 59s; **Kleint 5m 17s;** Bica 5m 23s; Miguel 5m 26s; Grissmann 5m 28s; Wittmann 5m 30s; Santoa 5m 39s; Fischer 5m 41s; Ortigäo 5m 44s; Mendes 5m 45s; Faria 5m 49s; Souto 5m 51s; Meylan 5m 53s; Breyner 5m 59s; "Tchine" 6m 0s.

**SS 18: ORBACEM-1 (11.5 km)**
**Röhrl 7m 4s;** Blomqvist 7m 6s; Biasion 7m 11s; Salonen 7m 12s; Vatanen 7m 47s; Moutinho 8m 1s; Ortigäo 8m 20s; Grissmann 8m 21s; Bica 8m 23s; **Kleint 8m 24s;** Mendes 8m 28s; Miguel 8m 30s; Souto 8m 34s; Wittmann 8m 47s; Fischer 8m 50s; Faria 9m 2s; Garvik 9m 3s; "Tchine" 9m 6s.

**STANDING AT THE END OF THE FIRST LEG**
**1. Biasion/Siverio (Lancia)1 hour 49m 34s (1st Group B);** 2. Röhrl/Geistdorfer (Audi) 1 hour 50m 32s; 3. Vatanen/Harryman (Peugeot) 1 hour 50m 32s; 4. Salonen/Harjanne (Peugeot) 1 hour 50m 59s; 5. Blomqvist/Cederberg (Audi) 1 hour 53m 25s; 6. Moutinho/Fortes (Renault) 1 hour 57m 50s; 7. Grissmann/Pattermann (Audi) 2 hours 5m 6s; **8.Kleint/Hohenadel (Volkswagen) 2 hours 5m 1s (1st Group A);** 9. Miguel/Nascimento (Ford) 2 hours 6m 10s; 10. Wittmann/Hinterleitn (Volkswagen) 2 hours 6m 50s; 11. Fischer/Zeltner (Peugeot) 2 hours 11m 53s; 12. Mendes/Cunha (Nissan) 2 hours 12m 28s; 13. Ortigäo/Btista (Toyota) 2 hours 13m 28s; 14. Souto/Ford (Ford) 2 hours 14m 7s; 15. Bica/Sena (Ford) 2 hours 17m 40s; 17. Santos/Oliveira (Ford) 2 hours 19m 0s; 18. "Tchine"/Fernandez (Ford) 2 hours 19m 32s; 19. Meylan/Duvaut (Nissan) 2 hours 19m 33s; **20. Segurado/-Bevilacqua (Renault) 2 hours 20m 17s (1st Group N);** 21. Cunha/Resende (Opel) 2 hours 20m 22s; 22. Rizzi/Fiorucci (Alfa Romeo) 2 hours 20m 26s; 23. Labrot/Canbaniols (Toyota) 2 hours 21m 54s; 24. Breyner/Lopes (Audi) 2 hours 22m 59s; 25. Ricci/Montagna (Opel) 2 hours 23m 30s; 26. Carreia/Moutinho (Ford) 2 hours 23m 50s; 27. Garvik/Monsen (Citroën) 2 hours 24m 23s; 28. Breyner/Branco (Volkswagen) 2 hours 24m 48s; 29. Moreno/Pereira (Opel) 2 hours 25m 4s; 30. Leite/Tavares (Volkswagen) 2 hours 25m 53s; 32. Lemos/Cesar (Volkswagen) 2 hours 26m 0s.

**SS 19: GAVEA-1 (11 km)**
**Vatanen 7m 43s;** Blomqvist 7m 45s; Röhrl 7m 47s; Salonen 7m 51s; Biasion 7m 58s; Moutinho 8m 43s; Grissmann 8m 52s; Miguel 8m 55s; Bica 8m 58s; **Kleint 8m 59s;** Mendes 9m 6s; Ortigäo 9m 10s; Wittmann 9m 12s; Souto 9m 17s; Fischer 9m 41s; Garvik 9m 44s; "Tchine" 9m 52s; Faria 10m 0s.

**SS 20: EXTREMO-1 (6.5 km)**
**Röhrl 3m 28s;** Vatanen 3m 31s; Blomqvist 3m 36s; Biaison 3m 39s; Salonen 3m 39s; Moutinho 4m 5s; Grissmann 4m 5s; Bica 4m 11s; Fischer 4m 11s; Miguel 4m 15s; **Kleint 4m 16s;** Wittmann 4m 16s; Mendes 4m 17s; Ortigäo 4m 20s; Souto 4m 23s; Ricci 4m 34s; "Tchine" 4m 36s; Garviak 4m 40s; Faria 4m 46s.

**SS 21: ARCOS/PORTELA-1 (27 km)**
**Salonen 18m 1s;** Röhrl 18m 9s; Biasion 18m 48s; Blomqvist 19m 22s; Bica 20m 56s; Mendes 21m 7s; Miguel 21m 11s; Ortigäo 21m 29s; Grissmann 21m 38s; **Kleint 22m 5s;** Souto 22m 18s; Fischer 22m 32s; Faria 22m 41s; Garvik 22m 48s; Wittmann 23m 15s; "Tchine" 23m 15s; Cunha 23m 20s; Santos 23m 24s; le Masson 23m 38s.

**SS 22: S. LOURENÇO-1 (27 km)**
**Salonen 20m 54s;** Röhrl 21m 10s; Blomqvist 21m 37s; Biasion 21m 39s; Moutinho 23m 24s; **Kleint 24m 12s;** Grissmann 24m 21s; Bica 24m 38s; Mendes 25m 13s; Ortigäo 25m 42s; Fischer 26m 49s; Garvik 26m 51s; Souto 26m 53s; Faria 27m 5s; "Tchine" 27m 30s; Cunha 28m 8s, Santos 28m 59s; Rizzi 29m 17s; Labrot 29m 29s.

**SS 23: ORBACEM-2 (11.5 km)**
**Röhrl 7m 19s;** Biasion 7m 31s; Blomqvist 7m 32s; Salonen 8m 9s; Moutinho 8m 34s; **Kleint 8m 37s;** Grissmann 8m 38s; Miguel 8m 49s; Ortigäo 9m 1s; Bica 9m 2s; Mendes 9m 15s; Fischer 9m 34s; Faria 9m 48s; Souto 10m 19s.

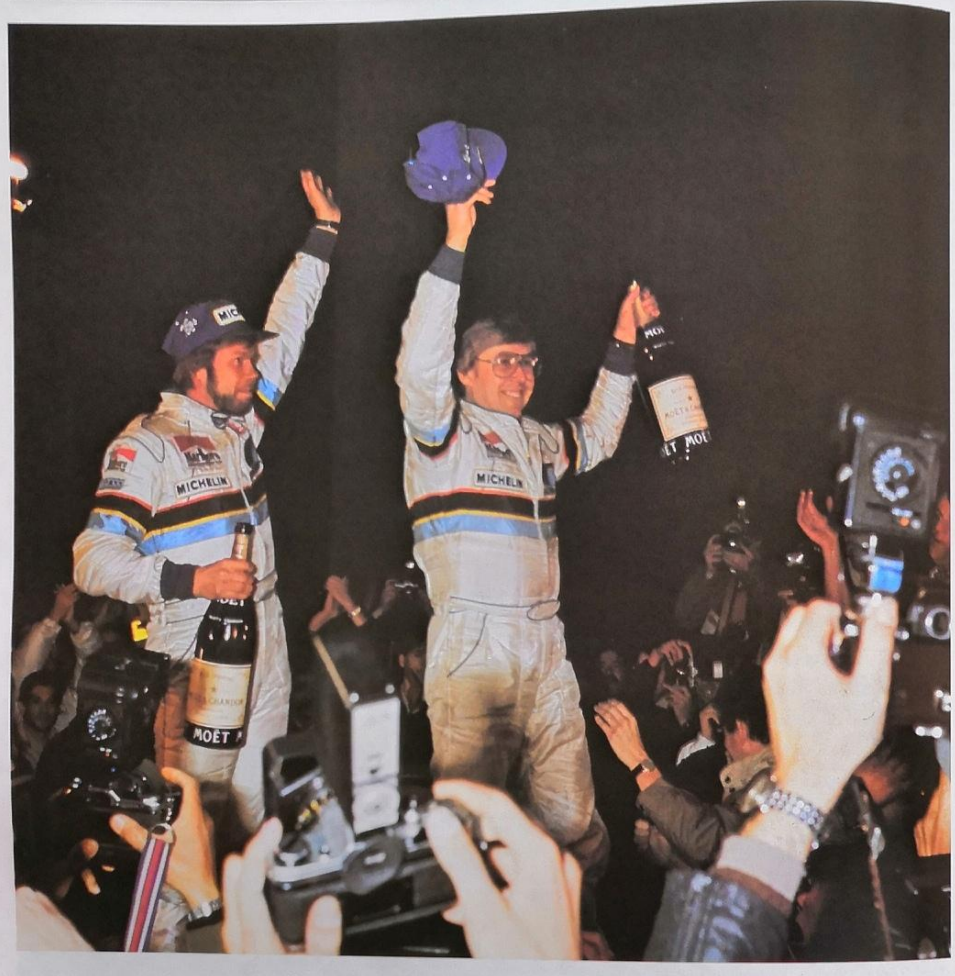
**SS 24: GAVEA (11.0 km)**
**Röhrl 7m 55s;** Salonen 8m 05s; Biasion 8m 11s; Blomqvist 8m 48s; **Kleint 9m 13s;** Moutinho 9m 14s; Grissmann 9m 20s; Miguel 9m 20s; Mendes 9m 39s; Fischer 10m 16s.

**SS 25: EXTREMO-2 (6.5 km)**
**Röhrl 3m 34s;** Blomqvist 3m 41s; Biasion 3m 45s; Salonen 3m 52s; **Grissmann 4m 17s;** Moutinho 4m 23s; Miguel 4m 29s; Bica 4m 38s; Ortigäo 4m 40s; Mendes 4m 41s; "Tchine" 4m 48s; Fischer 4m 50s.

**SS 26: ARCOS-PORTELA-2 (27 km)**
**Röhrl 18m 17s;** Salonen 18m 36s; Blomqvist 18m 50s; Biasion 19m 16s; Moutinho 20m 45s; Grissmann 21m 27s; Miguel 21m 42s; Mendes 21m 49s; Bica 21m 58s, Ortigäo 22m 22s; Fischer 22m 52s.

**SS 27: S. LOURENÇO-2 (27,0 km)**
**Röhrl 21m 36s;** Blomqvist 21m 45s; Biasion 22m 31s; Salonen 23m 38s; Moutinho 24m 44s; Miguel 25m 11s; Bica 25m 39s; Grissmann 25m43s; Ortigäo 25m 55s; "Tchine" 26m 45s; Faria 27m 36s; Mendes 28m 48s; Cunha 29m 11s; Rizzi 29m 13s; Santos 29m 20s; Vasile 29m 26s; Moreno 30m 7s; Breyner 30m 10s; Labrot 30m 24s; Lemos 30m 39s.

**STANDING AT THE END OF THE SECOND LEG**
**1. Röhrl 3 hours 47m 1s;** 2. Biasion 3 hours 50m 3s; 3. Salonen 3 hours 50m 56s; 4. Blomqvist 3 hours 57m 27s; 5. Moutinho 4 hours 14m 38s; 6. Grissmann 4 hours 21m hours 14m 38s; 6. Grissmann 4 hours 21m hours 14m 38s; 6. Grissmann 4 hours 21m



4m 55s; **Ortigäo 5m 7s**; "Tchine" 5m 9s; Fischer 5m 16s; Rizzi 5m 23s; Faria 5m 34s.
**SS 39: VISEU-2 (26.5 km)**
**Blomqvist 17m 7s**; Röhrl 17m 17s; Salonen 17m 43s; Biasion 17m 59s; Mendes 20m 21s; Miguel 20m 37s; Bica 20m 38s; Grissmann 21m 35s; **Ortigäo 22m 19s**.

**STANDING AT THE END OF THE THIRD LEG**

**1. Röhrl 6 hours 2m 0s**; 2. Salonen 6 hours 8m 22s; 3.Biasion 6 hours 10m 50s; 4. Blomqvist 6 hours 16m 2s; 5.Grissmann 6 hours 58m 16s; 6. Miguel 7 hours 3m 15s; 7.Bica 7 hours 12m 8s; 8. Mendes 7 hours 13m 59s; 9. **Ortigäo 7 hours 21m 21s**; 10. Faria 7 hours 43m 29s; 11. Fischer 7 hours 50m 5s; 12. "Tchine" 7 hours 51m 25s; 13. Cunha 7 hours 54m 39s; 14. Santos 8 hours 5m 42s; 15. Rizzi 8 hours 11m 21s; 16. Breyner 8 hours 12m 20s; 17. Moreno 8 hours 13m 50s; 18. Breyner 8 hours 14m 15s; 19. Labrot 8 hours 14m 57s; 20. Lemos 8 hours 15m 43s; 21. Vasile 8 hours 24m 34s; 22. Ramos 8 hours 30m 19s; 23. Balint 8 hours 35m 11s; 24. Klein 8 hours 40m 29s; 25. Amaral 9 hours 1m 59s; 26. Amaral 9 hours 3m 50s; 27. Urdea 9 hours 20m 36s; 28. Leymarie 9 hours 30m 12s; 29. Vistas 9 hours 41m 19s; 30. Sabença 10 hours 0m 16s; 31. Saralva 10 hours 59m 49s; 32. Wrzecian 12 hours 7m 9s.

**ES 40: ARGANIL-1 (56.5 km)**
**Salonen 38m 24s**; Biasion 39m 45s; Röhrl 42m 7s; Bica 42m 56s; Mendes 43m 45s; Miguel 43m 54s; Blomqvist 44m 26s; Grissmann 46m 39s; **Faria 47m 53s**; Fischer 48m 55s; Ortigäo 49m 15s; "Tchine" 49m 23s; Labrot 50m 13s; Cunha 51m 17s.
**SS 41: CANDOSA-1 (6.5 km)**
**Röhrl 4m 39s**; Salonen 4m 41s; Biasion 4m 47s; Blomqvist 4m 53s; Grissmann 4m 58s; Bica 5m 14s; Miguel 5m 25s; Mendes 5m 34s; **Ortigäo 5m 57s**; Faria 6m 1s; Breyner 6m 9s; Labrot 6m 10s; Moreno 6m 20s; Vasile 6m 23s; Rizzi 6m 24s.
**SS 42: LOUSA-1 (10.5 km)**
**Salonen 7m 21s**; Blomqvist 7m 31s; Röhrl 7m 32s; Biasion 7m 44s; Grissmann 8m 6s; Bica 8m 13s; Mendes 8m 24s; Miguel 8m 32s; **Faria 8m 46s**; Moreno 9m 14s; Labrot 9m 24s.
**SS 43: ARGANIL-2 (56.5 km)**
**Salonen 38m 48s**; Biasion 39m 27s; Röhrl 41m 35s; Grissmann 42m 50s; Miguel 43m 52s; Bica 44m 10s; Breyner 47m 38s; Blomqvist 48m 0s; Labrot 49m 40s; Santos 50m 7s; **Ortigäo 50m 26s**; Faria 50m 44s; Klein 50m 58s.
**SS 44: CANDOSA-2 (6.5 km)**
**Röhrl 4m 40s**; Blomqvist 4m 45s; Biasion 4m 46s; Salonen 4m 54s; Grissmann 5m 6s; Bica 5m 21s; Miguel 5m 38s; Mendes 5m 50s; **Ortigäo 5m 50s**; Breyner 5m 54s; "Tchine" 6m 2s; Faria 6m 6s; Labrot 6m 8s; Klein 6m 21s.
**SS 45: LOUSA-2 (10.5 km)**
**Röhrl 7m 25s**; Salonen 7m 34s; Biasion 7m 35s; Blomqvist 8m 19s; Grissmann 8m 20s; Bica 8m 30s; Breyner 8m 45s; Miguel 8m 46s; **Ortigäo 8m 53s**; Faria 9m; "Tchine" 9m 12s; Labrot 9m 19s; Santos 9m 24s; Mendes 9m 24s.
**SS 46: MARTINCHEL (9km)**
**Biasion 6m 17s**; Salonen 6m 23s; Blomqvist 6m 43s; Grissmann 6m 43s; **Faria 7m 12s**; Miguel 7m 18s; Santos 7m 19s; Bica 7m 19s; Breyner 7m 19s; Mendes 7m 22s; Cunha 7m 36s; "Tchine" 7m 37s; Lemos 7m 39s; Rizzi 7m 41s; Ortigäo 7m 44s.
**SS 47: CORUCHE (20 km)**
**Röhrl 10m 18s**; Blomqvist 10m 32s; Salonen 10m 58s; Biasion 11m 1s; Grissmann 12m 22s; Breyner 12m 39s; Santos 12m 47s; "Tchine" 13m 18s; Cunha 13m 33s; Bica 13m 40s; Rizzi 13m 49s; Breyner 14m; Miguel 14m 2s; **Faria 14m 5s**; Ortigäo 14m 7s.

## TECHNICAL DATA

**19th edition of the Potuguese Rally.**
**Date:** March 5th-9th, 1985.
3rd round of the World Rally Championship for drivers.
**Start and Finish:** Estoril (Portugal).
**Route:** 2,455 km/1,534.3 miles comprising 47 special stages covering a total of 730.5 km/456.5 miles. 17 tarmac stages (185.5 km/115.9 miles) and 30 gravel stages (545 km/340.6 miles). The Rally was divided into four legs.
**1st Leg:** Estoril - Povoa de Varzim from March 6th, 09:00 to March 7th, 06:00, covering a total of 796 km/497.5 miles. 17 tarmac special stages covering a total of 185.5 km/115.9 miles.
**2nd Leg:** Povoa - Povoa, March 7th from 14:00 to 24:00, 422.7 km/264.1 miles. 10 gravel special stages covering a total of 166 km/103.7 miles.
**3rd Leg:** Povoa-Viseau, March 8th, from 08:00-20:30, covering a total of 487.9 km/304.9 miles. 12 gravel special stages covering a total of 203 km/126.8 miles.
**4th Leg:** Viseau - Estoril, from March 9th, 05:00 to 23:00, 748.3 km/467.6 miles. 8 special stages covering a total of 176 km/110 miles.
**Entries:** 109; **Starters:** 94; **Finishers and Classified :** 28.
**Driving conditions :** Fine and dry throughout the Rally. Heavy rains before the start meant there was no dust.

## MAIN RETIREMENTS

Dorche/Lejeune (Citroën Visa 1000 Pistes) SS 16: suspension.
Vatanen/Harryman (Peugeot 205 Turbo 16) SS 21: suspension knuckle.
Wittmann/Hinterleitner (VW Golf GTi) SS 23: injection.
Kleint/Hohenadel (VW Golf GTi) SS 25: gearbox
Moutinho/Fortes (Renault 5 Turbo) SS 39 : valves.
Fischer/Zeltner (Peugeot 205 Turbo 16) SS 41: engine.

## SUCCESSIVE LEADERS

SS 1 - 2: Röhrl.
SS 3: - 7: Biasion.
SS 8: - 11: Röhrl.
SS 12: - 20: Biasion.
SS 21: - 40: Röhrl.
SS 41: - 47 (finish): Salonen.

## WORLD RALLY CHAMPIONSHIP (Drivers)

(Results after third of twelve rounds, Monte Carlo, Sweden).

| | |
|---|---|
| **1. Timo Salonen (SF)** | 12 + 12 + 20 = **44** |
| 2. Ari Vatanen (SF) | 20 + 20 + — = 40 |
| 3. Stig Blomqvist (S) | 10 + 15 + 10 = 35 |
| 4. Walter Röhrl (D) | 15 + — + 12 = 27 |
| 5. Massimo Biasion (I) | — + 10 + — = 10 |
| 6. Hannu Mikkola (SF) | 8 + — + — = 8 |
| 7. Bruno Saby (F) | — + 8 + — = 8 |
| Per Eklund (S) | — + — + 8 = 8 |
| Werner Grissmann (A) | 6 + — + — = 6 |
| 10. Henri Toivonen (SF) | — + 6 + — = 6 |
| Gunnar Pettersson (S) | — + — + 6 = 6 |
| Jose Miguel (P) | |

13. Danny Snobeck (F), Mikaël Ericsson (S) and Carlos Bica (P) 4; 16. Jean-Claude Andruet (F), Ingvar Carlsson (S) and Santinho Mendes (P) 3; 19. Mats Jonsson (S) and Jorge Ortigao (P) 2; 21. Maurice Chomat (F), Kenneth Eriksson (S) and Pedro Leite Faria (P) 1.

## WORLD RALLY CHAMPIONSHIP (Makes)

(Results after third of eleven rounds, Monte Carlo, Sweden.)

| | |
|---|---|
| **1. Peugeot** | 18 + 18 + 18 = **54** |
| 2. Audi | 16 + 16 + 14 = 46 |
| 3. Lancia | 8 + — + 16 = 24 |
| 4 Toyota | — + — + 10 = 10 |
| 5. Ford | — + — + 8 = 8 |
| 6. Renault | 6 + — + — = 6 |
| Mazda | — + 6 + — = 6 |
| 6. Citroën | 4 + 6 + — = 4 |
| Opel | — + 4 + — = 4 |
| Nissan | — + — + — = 4 |

## BEST RESULTS

| | 1 | 2 | 3 | 4 | 5 | 6 | A | B |
|---|---|---|---|---|---|---|---|---|
| Röhrl | 23 | 13 | 6 | 4 | — | — | 46 | 47 |
| Biasion | 12 | 4 | 13 | 16 | 2 | — | 47 | 47 |
| Salonen | 8 | 9 | 16 | 13 | 1 | — | 47 | 47 |
| Blomqvist | 5 | 16 | 5 | 5 | 12 | 2 | 45 | 47 |
| Vatanen | 3 | 4 | 5 | 5 | 3 | — | 20 | 20 |
| Grissmann | — | — | 1 | 1 | 9 | 4 | 15 | 47 |
| Moutinho | — | — | — | 1 | 11 | 21 | 33 | 38 |
| Bica | — | — | — | 1 | 2 | 11 | 14 | 47 |
| Miguel | — | — | — | — | 3 | 4 | 7 | 47 |
| Mendes | — | — | — | — | 2 | 1 | 3 | 47 |
| Kleint | — | — | — | — | 1 | 2 | 3 | 24 |
| Leite Faria | — | — | — | — | 1 | — | 1 | 47 |
| Breyner | — | — | — | — | — | 1 | 1 | 47 |

**A: Number of placings in first 6.**
**B: Number of special stages covered.**

## FEATURES

**Rally**
A five-minute penalty was given to any crew not obeying orders between the time check and the start of a stage to avoid any overtaking in this area.
**Drivers**
First win for Timo Salonen at the wheel of the Peugeot 205 Turbo 16.
First win for Timo Salonen in a European round of the World Rally Championship.
Timo Salonen is now the provisional World Rally Championship leader.
Debuts for Franz Wittmann in the VW and Jochi Kleint in the Group A Golf GTi.

## PAST RESULTS

(Last ten years)
1975: Alen/Kivimaki (Fiat 124 Abarth Spider).
1976: Munari/Maiga (Lancia Stratos).
1977: Alen/Kivimaki (Fiat 131 Abarth).
1978: Alen/Kivimaki (Fiat 131 Abarth).
1980: Röhrl/Geistdorfer (Fiat 131 Abarth).
1981: Alen/Kivimaki (Fiat 131 Abarth).
1982: Mouton/Pons (Audi Quattro).
1983: Mikkola/Heryz (Audi Quattro).
1984: Mikkola/Hertz (Audi Quattro).

## FOR THE RECORD

6th consecutive victory in a World Rally Championship round for the Peugeot 205 Turbo 16. For the first time since Vatanen has been driving for Peugeot, he did not lead the Rally once.

## FINAL RESULTS

1. **Salonen/Harjanne (Peugeot 205 Turbo 16) 8 hours 07m 25s (1st Group B).**
2. Biasion/Siviero (Lancia Rally) 8 hours 12m 12s.
3. Röhrl/Geistdorfer (Audi Quattro Sport) 8 hours 13m 23s.
4. Blomqvist/Cederberg (Audi Quattro Sport) 8 hours 31m 11s.
5. Grissmann/Patterman (Audi Quattro) 9 hours 13m 20s.
6. Miguel/Nascimento (Ford Escort RS 1800) 9 hours 20m 42s.
7. Bica/Sena (Ford Escort RS 1800) 9 hours 28m 31s.
8. Mendes/Cunha (Nissan 240 RS) 9 hours 40m 22s.
9. **Ortigao/Batista (Toyota Corolla 1600 GT) 9 hours 52m 25s (1st Group A).**
10. Leite Faria/Manuel (Ford Escort RS 2000) 10 hours 13m 16s.
11. "Tchine"/Fernandes (Opel Manta) 10 hours 30m 21s.
12. Cunha/Resende (Opel Ascona) 10 hours 30m 43s.
13. Santos/Oliveira (Ford Escort RS 1600) 10 hours 45m 33s.
14. Labrot/Cabanois (Toyota Corolla GT) 10 hours 49m 29s.
15. Lemos/Cesar (VW Golf GTi) 10 hours 53m 41s.
20. **Klein/Witzmann (Peugeot 205 GTi) 11 hours 23m 34s (1st Group N).**

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# POST BAG

## ROAD TO DISASTER?

Dear GPI,
I have been a regular subscriber to Grand Prix International for years and I feel it has no rivals, but I must say I am convinced you are on the road to disaster with your new format.
In the letter I received from you last year explaining why publications has so suddenly ceased, you admitted you had gambled on a new format embracing more than just F1 and, judging by letters from subscribers and falling sales, your gamble failed.
I must say I see no relevance whatsoever in reviewing new expensive, glossy saloon/sports cars like you did in the December and February issues, in fact I have even given my February edition away, the first time I have ever done this. Why not concentrate on the most popular motor sport, F1. There are fantastic topics that you are totally ignoring - various team testing results, more British drivers in F1 than for a long time, you could interview any number of drivers, Nigel Mansell's move to Williams, especially Alan Jones' return. All this you have ignored. I feel that I unless you return to your original format of F1 with occasional forays into CART, Indy and so on, you are doomed. Please print my letter as I am certain many other subscribers feel the same.
Yours sincerely.
***N Cheshire,***
***16 Sutton Road,***
***Eldmere, Swindon***
PS. As a post script I should add I am forced to rely on other motor racing mags to keep me up to date with F1 which reinforces my argument.

*Dear Mr Cheshire,*
*We are aware of our drift away from the original spirit of GPI but sales have picked up the world over and the new production team came to the helm during the close-season. We are sure you'll agree the March and April editions include a lot more F1 topics, simply because there's something to talk about!*
*Happy reading,*
*GPI.*

## HASTY DECISION?

Dear GPI,
Is it honestly fair that Elio de Angelis has to put up with Ayrton Senna, who has only done one year in Formula One, whilst Elio has completed six or so as a joint number one in the 1985 Team Lotus line-up? (Also considering that Elio as an experienced F1 driver has done two seasons with Renault power and Goodyear tyres).
Perhaps this was a bit hasty and for the 1985 season he should have raced as a number two and then gone up to a number one for the 1986 season, if he proves himself capable.
Anyway, I hope that Elio comes higher in the world championship than Ayrton, although I wish both good luck for the coming season, which Lotus must be the equal favourites with Ferrari for the constructors' title.
Best wishes from,
***Tom Gordon (age 14)***
***Seconds House,***
***Lancing College,***
***Lancing,***
***W Sussex.***

*Dear Tom,*
*Here at GPI we wish all the drivers good luck!*
*Hope to hear from you again,*
*GPI.*

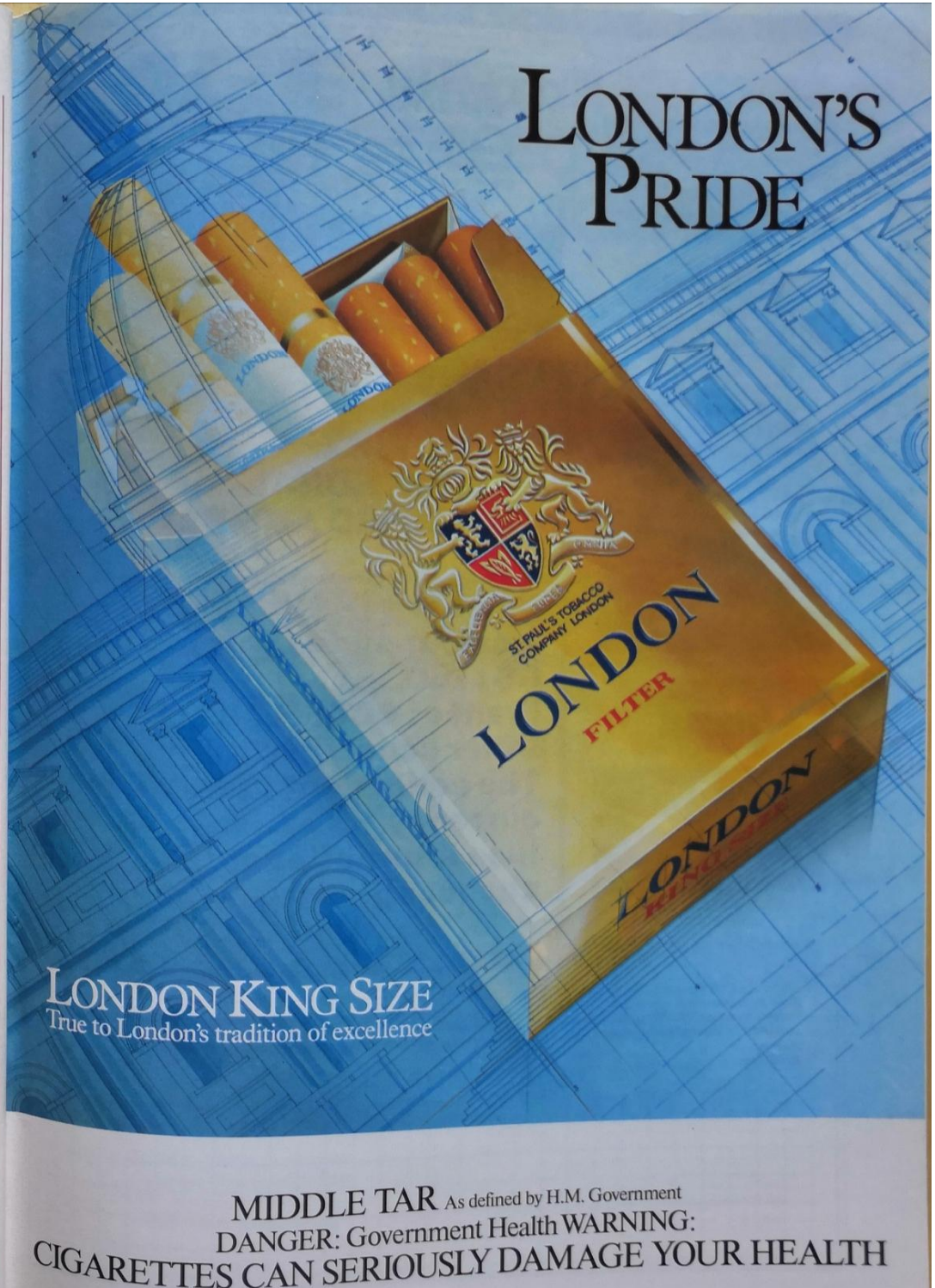
## WORD-SEARCH

Dear GPI,
In reply to your suggestion for readers to send in their comments about the sport and how to improve your magazine I thought it would be a good idea if you put more in the magazine about what is happening in the teams during the off-season, and maybe have some small competitions. Having thought of this I have made a small word-search competition.
Yours faithfully,
***Dean Horlock (age 13)***
***37 Robins Close,***
***Lenham,***
***Maidstone,***
***Kent.***
***ME17 2LD***

| | | |
|---|---|---|
| Alboreto | Hunt | Prost |
| Andretti | Ickx | Rosberg |
| Ascari | Jones | Senna |
| Arnoux | Lafitte | Stewart |
| Brabham | Lauda | Tambay |
| Cheever | Mansell | Warwick |
| De Cesaris | Moss | Winkelhock |
| De Angelis | Patrese | Villeneuve |
| Fabi | Pironi | |
| Fittipaldi | Piquet | |

*Dear Readers,*
*These two columns are yours to vent your views and make suggestions. Please write to: The Production Editor, Grand Prix International.*





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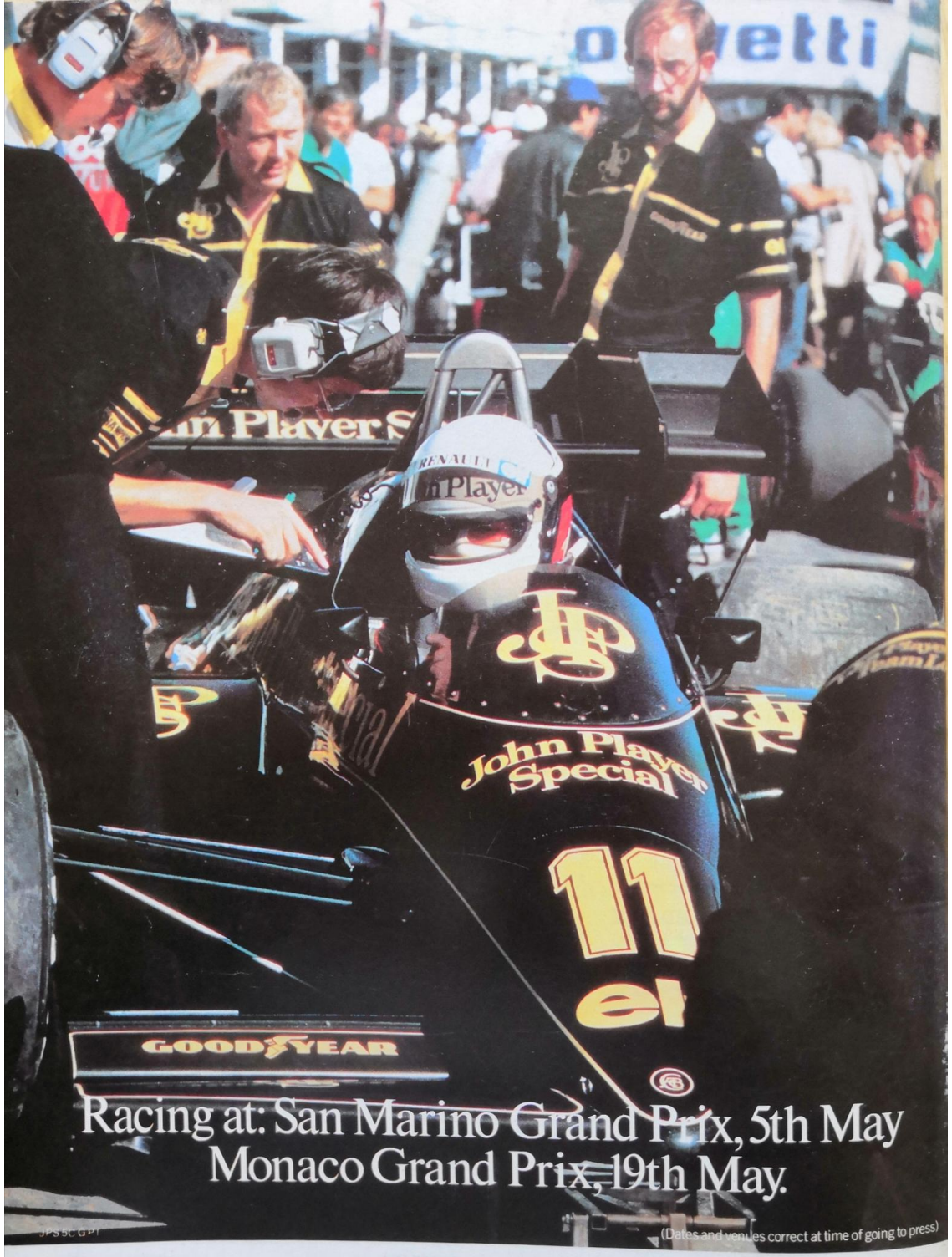


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